Behavioural Atom Protocol Version 1.0

Working Draft 02

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Additional artefacts:

There are no additional artefacts to this prose specification.

Related work:

This specification is related to:

* Roles, Principles, and Ecosystem Version 1.0 (http://docs.oasis-open.org/coel/RPE/v1.0/RPE-v1.0.docx).
* Minimal Management Interface Version 1.0 (<http://docs.oasis-open.org/coel/MMI/v1.0/MMI-v1.0.docx>).
* Classification of Everyday Living Version 1.0 (<http://docs.oasis-open.org/coel/COEL/v1.0/COEL-v1.0.docx>).
* Identity Authority Interface Version 1.0 (http://docs.oasis-open.org/coel/IDA/v1.0/IDA-v1.0.docx).
* Public Query Interface Version 1.0 (http://docs.oasis-open.org/coel/PQI/v1.0/PQI-v1.0.docx).

Abstract:

This document defines a protocol for data exchanges that are capable of describing, querying and reporting a human activity event (Behavioural Atom) using the COEL model classification, as well as the context in which it took place (e.g. time, location).

Status:

This [Working Draft](https://www.oasis-open.org/policies-guidelines/tc-process#dWorkingDraft) (WD) has been produced by one or more TC Members; it has not yet been voted on by the TC or [approved](https://www.oasis-open.org/policies-guidelines/tc-process#committeeDraft) as a Committee Draft (Committee Specification Draft or a Committee Note Draft). The OASIS document [Approval Process](https://www.oasis-open.org/policies-guidelines/tc-process#standApprovProcess) begins officially with a TC vote to approve a WD as a Committee Draft. A TC may approve a Working Draft, revise it, and re-approve it any number of times as a Committee Draft.

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# Introduction

Behavioural Atoms represent distinct human behavioural events. Their granularity has been designed so that they are small in terms of data volume but detailed enough to capture a single human behaviour (e.g. eating egg based noodles or swimming laps of butterfly). The format of the Behavioural Atom allows many aspects of a human activity event to be coded – the type of event, the individual that the event relates to, the time it occurred, how it was recorded, location and context. The coding for the type of event references the hierarchical taxonomy defined in the Classification of Everyday Living [COEL**\_COEL-1.0]**.

The terms ‘Atom’ and ‘Behavioural Atom’ are interchangeable in this document

This document describes the structure of a Behavioural Atom (section 3) and the protocol for transmitting Atoms to a Data Engine (section 2)

## Terminology

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

## Normative References

[RFC2119] Bradner, S., “Key words for use in RFCs to Indicate Requirement Levels”, BCP 14, RFC 2119, March 1997. <http://www.ietf.org/rfc/rfc2119.txt>.

**[RFC2616]** R. Fielding et al, Hypertext Transfer Protocol – HTTP/1.1, <http://www.ietf.org/rfc/rfc2616.txt>.

**[RFC3986]** T.Berners-Lee et al, Uniform Resource Identifiers (URI): Generic Syntax, August 1998, <http://www.ietf.org/rfc/rfc3986.txt>.

**[RFC4627]** D. Crockford, The application/json Media Type for JavaScript Object Notation (JSON), July 2006, <http://www.ietf.org/rfc/rfc4627.txt>.

**[RFC5246]** T. Dierks and E. Rescorla, The Transport Layer Security (TLS) Protocol Version 1.2, <http://www.ietf.org/rfc/rfc5246.txt>.

[COEL\_RPE-1.0] *Roles, Principles, and Ecosystem Version 1.0.* Latest version: <http://docs.oasis-open.org/coel/RPE/v1.0/RPE-v1.0.docx>

[COEL**\_IDA-1.0]** *Identity Authority Interface Version 1.0.* Latest version: <http://docs.oasis-open.org/coel/IDA/v1.0/IDA-v1.0.docx>

[COEL**\_COEL-1.0]** *Classification of Everyday Living Version 1.0.* Latest version:<http://docs.oasis-open.org/coel/COEL/v1.0/COEL-v1.0.docx>

[Weather] *OpenWeatherMap, Weather Condition Codes.* Latest version: <http://openweathermap.org/weather-conditions>.

**[ISO 3166]** *ISO 3166 Country codes.* Latest version: <http://www.iso.org/iso/country_codes>

**[MVCR-v0.7.9]** *Kantara CISWG Consent Receipt*. Latest version: <https://kantarainitiative.org/confluence/display/infosharing/Home>

## Non-Normative References

[Data to Life] Reed, M. & Langford, J. (2013). Data to Life. Coelition, London. ISBN 978-0957609402

# Data Engine Behavioural Atom Protocol

The Behavioural Atom Protocol requires that a Data Engine provides the following

1. A Home URI
2. Aon the
3. A POST operation on the Atom URI

## Use of HTTP

All interfaces are designed around the HTTP protocol stack [[HTTP](http://www.w3.org/Protocols/)] and in particular rely on the REST based operational model. Each message includes one of the HTTP verbs, in particular GET or POST only, and further information depending on the operation being performed. This later information is included in the message body as a JSON object [[JSON](https://tools.ietf.org/html/rfc7159)].

In line with REST style protocol conventions, all accessible entities in the system SHALL be identifiable and reachable through dereferencing a URL unique to that entity. Entry to the system as a whole is via a well-known initial URI, known as the Data Engine Home URI.

## Media Types for Messages

If the media type is present in the message, it SHALL be “application/json”. Atom server implementations SHALL accept message with this media type or none. However, they MAY reject malformed or oversized messages.

# 

## Data Engine Information Request

Every Data Engine SHALL publish its Data Engine Home URI. Performing a GET on this URI SHALL return general information about the Data Engine as JSON object.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Method** | **Request** | **Response**  **Status** | **Response Content-Type** | **Response Body** |
| GET | None | 200 (OK) | application/json | JSON object |
| POST | Any | 405 (Method Not Allowed) | None | None |

Format for the returned JSON Object:

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| AtomsURI | String | The URI of the Atoms service encoded as a string. | Yes |
| QueryURI | String | The URI of the Query service encoded as a string. | Yes |
| ManagementURI | String | The URI of the Management service encoded as a string. | Yes |
| ServerTime | Integer | Current server time in UTC as a Unix timestamp. | Yes |
| AtomsStatus | String | The current status of the Atoms service encoded as a string. It MUST be one of “Up”, “Down”, or “Unknown”. | Yes |
| QueryStatus | String | The current status of the Query service encoded as a string. It MUST be one of “Up”, “Down”, or “Unknown”. | Yes |
| ManagementStatus | String | The current status of the Management service encoded as a string. It MUST be one of “Up”, “Down”, or “Unknown”. | Yes |

The JSON object of the response MAY contain additional fields with information about the Data Engine.

### Example (non-normative)

Example request message:

GET /home

Example response message:

HTTP/1.1 200 OK

{“AtomsURI”: “https://www.dataengine.com/atoms”,

“QueryURI”: “https://www.dataengine.com/query”,

“ManagementURI”: “https://www.dataengine.com/management”,

“AtomsStatus”: “Up”,

“QueryStatus”: “Up”,

“ManagementStatus”, “Up”,

“ServerTime”: 1470822001}

## Atom POST

To add a Behavioural Atom to the Data Engine, a POST operation SHALL be sent to the Atom POST URI. The POST SHALL include a non-empty body containing either a single JSON Atom Object or a JSON array containing one or more Atom Objects. The Content-Type of the message MUST be ‘application/json’.

Responses:

### HTTP status code of 202 (Accepted)

Indicates the operation was successful and all of the atoms in the request body are accepted by the data engine. The caller is not required to resubmit any of the atoms.

The response body is empty.

### An HTTP error code or No Response

An error code is any HTTP status code greater or equal to 300.

Indicates that an error has occurred and none of the atoms in the request are accepted. The caller MAY retry the operation or in the case of an array of atoms, may make an attempt to submit each individual atom in a separate request.

The response body is either empty or contains a single JSON object that gives a reason for the failure. The reason object contains one name/value pair:

Name = "Reason"

Value = string : textual description of the reason for the failure.

Example (non-normative):

{ "Reason" : "ConsumerID missing" }  
  
The following specific error codes MAY be used to give the more information about the error:

**400 (Bad Request)** indicates one of the following:

* the request body does not contain valid JSON,
* one or more of the Atoms in the request body is missing required elements
* one or more of the elements in the Atoms is missing required fields.
* one or more of the fields has an invalid value.

**404 (Not Found)** indicates that the Atom POST URI may have changed. The client can obtain the correct URI from the Data Engine Information Request.

**405 (Bad Request)** if the request method is not POST.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Method** | **Request**  **Content-Type** | **Request Body** | **Atoms accepted by Data Engine** | **Scheme 1  Response** | | **Scheme 2  Response** | |
| **Status** | **Body** | **Status** | **Body** |
| POST | application/  json | Valid JSON Atom(s) | All | 202 | None | 202 | None |
| GET | Any | Any | None | 500 | None | 405 | None or JSON Object with a reason |
| POST | application/  json | Invalid JSON | 400 |
| POST | application/  json | Malformed Atom(s) | 400 |
| POST | Data Engine encounters internal error. | | 500 |

### Example (non-normative)

Example request message:

POST /atoms

Content-Type: application/json

Content-Length: nn

{ … }

Example response message:

HTTP/1.1 202 OK

Example request message with an incorrect content type:

POST /atoms

Content-Type: image/png

Content-Length: 2134

{ … }

Example response message:

HTTP/1.1 500 Internal Error

## Security

The Data Engine cannot authenticate the sender, since the Data Engine has no relationship with the consumer. In order to provide some for of security for trusted sources however, there are two schemes for providing the Atom POST operation.

Under Scheme 1, the Data Engine provides the operation with anonymous TLS only. Under this scheme, the Data Engine is only required to support response codes of 202 and 500 and the response body will always be empty.

Under Scheme 2, for which the Data Engine will require some form of authentication, it may support additional response codes and provide additional information in the response body, as specified in section 2.5 above.

## Exceptions

The Data Engine MUST specify (e.g. through contract terms, on a web site, or as additional data in the Information Request response) how it will manage the following exceptional circumstances when receiving data:

* Duplicate Atom posts (e.g. over-write, return error, duplicate created)
* Atoms with invalid or missing ConsumerIDs and DeviceIDs
* Atoms with unallocated ConsumerIDs and DeviceIDs
* Atoms with missing essential fields
* Incorrectly formed Atoms

# Behavioural Atom Definition

A Behavioural Atom is represented as a JSON object which contains one or more of the elements specified in this section of the document. Each section of this document (with the exception of the example sections) specifies one of the elements of a Behavioural Atom

An atom object SHALL have the following format. The top level JSON SHALL be an object with the elements described below:

## Atom Header

Name: “Header”

Required: Yes

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Version | Integer Array [0..3] | Array indicating the model version number used to define this Atom. | Yes |
|  | Index 0 | Level 1: Must increment when a non-backwards compatible change is made, e.g. new structure or changing the value of an existing field.  MUST run through full OASIS process. | Yes |
| Index 1 | Level 2: Incremented for any release that is backwards compatible, e.g. only new fields.  MUST be agreed by the OASIS Committee. | Yes |
| Index 2 | Level 3: Experimental – incremented to working draft publications that are for public release. | Yes |
| Index 3 | Level 4: For developments outside the OASIS TC and will always be “0” in any OASIS version. | Yes |

## Context of the event

Name: “Context”

Required: No

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Social | Integer, 0-6 | Indicates the social context of the activity | No |
| Weather | Integer, 0-999 | Indicates the general weather conditions at the time of the activity | No |
| ContextTag | Integer | Context provides the ability to encode “Why” information | No |
| ContextValue | Integer | Value of Context annotation. | Yes if Context Tag present |

The enumeration values for Social SHALL be:

0: Don’t Know

1: Family

2: Colleagues

3: Guests

4: Partner

5: Myself

6: Friends

The enumeration values for Weather SHALL be those of the Open Weather Map weather condition code scheme [Weather].

There are no ContextTags defined in this version of the specification, but these MAY include references to previous Atoms to indicate causality or question / answer pairs to sequence interactions.

## Time and Duration of the event

Name: “When”

Required: Yes

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Time | Integer | Seconds since 1970/01/01 00:00Z (Unix timestamp in UTC) | Yes |
| UTCOffset | Integer | UTC Offset in seconds (e.g. UTC+1h = 3600, UTC-2h = -7200…) for the sender. | No |
| Accuracy | Integer, 0-14 | Indicates accuracy of the time field | No |
| Duration | Integer | Duration of the activity in seconds. Does absence of this field mean the same as Duration:0? | No |

The enumeration values for Accuracy SHALL be:

0: +/- 1 sec (exact)

1: +/- 1 min (default)

2: +/- 5 mins

3: +/- 15 mins

4: +/- 30 mins

5: +/- 1 hr

6: +/- 2 hrs

7: +/- 4 hrs

8: +/- 8 hrs

9: +/- 12 hrs

10: +/- 24 hrs (weekend)

11: +/- 72 hrs (week)

12: +/- 15 days (month)

13: +/- 91 days (season)

14: +/- 182 days (year)

This value refers to the accuracy reported and not necessarily the actual accuracy at which the measurement was obtained.

Atoms with duration of zero MAY be used and indicate and instantaneous event (or one where the duration is less than a second). A zero duration Atom MAY also be a marker for the end of a sequence of Atoms such as in a running route, see section 3.6 Where.

## What

Event as defined by the COEL model **[**COEL**\_COEL-1.0]**:

Name: “What”

Required: Yes

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Cluster | Integer, 1-99 | COEL cluster. | Yes |
| Class | Integer, 1-99 | COEL class, if available omit otherwise. | Only when ‘Subclass’ is also used. |
| SubClass | Integer, 1-99 | COEL subclass, if available omit otherwise. | Only when ‘Element’ is also used. |
| Element | Integer, 1-99 | COEL element, if available omit otherwise. | No |

When appropriate event descriptions are not available in the latest version of the COEL model, development codes MAY be used for new applications. These codes SHALL use the format 1xxxx (i.e. integers in the range 10000 to 19999. These codes MAY be used at any level of the COEL model.

## How

How the event was measured:

Name: “How”

Required: No

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| How | Integer, 0-11 | An enumerated value describing how the information was provided | No |
| Certainty | Integer, 0-100 | Percentage, certainty that this Atom is associated with the individual indicated in the Who field | No |
| Reliability | Integer, 0-100 | Percentage, reliability of this atom as a whole. The default SHALL be 50, with 100 only being used for correction atoms. | No |

The enumeration values for How SHALL be:

0: Don’t Know

1: Observed

2: Objectively Measured: Public Infrastructure

3: Objectively Measured: Private Infrastructure

4: Objectively Measured: Fixed Computing Device

5: Objectively Measured: Portable Computer

6: Objectively Measured: Phones and Pocket Device

7: Objectively Measured: Wearables

8: Objectively Measured: Implants

9: Self-Reported

10: Remembered

11: Computationally derived from other Atoms

## Where

Where the event occurred:

Name: “Where”

Required: No

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Exactness | Integer, 0-14 | Format and precision of where fields | No |
| Latitude | Double | GPS location | No |
| Longitude | Double | GPS location | No |
| W3W | String | what3words code (word.word.word) | No |
| Place | Integer, 0-2 | Profane location code | No |
| Postcode | String | Postcode | No |

The enumeration values for Exactness SHALL be:

0: Unknown.

1: Postcode or Zip code very long form.

2: Postcode or Zip code long form.

3: Postcode of Zip code short form

4: Place

5: GPS with accuracy between 0m and 1m.

6: GPS with accuracy between 1m and 5m.

7: GPS with accuracy between 5m and 10m.

8: GPS with accuracy between 10m and 15m.

9: GPS with accuracy between 15m and 20m.

10: GPS with accuracy between 20m and 25m.

11: GPS with accuracy between 25m and 30m.

12: GPS with accuracy between 30m and 50m.

13: GPS with accuracy between 50m and 100m.

14: GPS with accuracy worse than 100m.

The enumeration values for Place SHALL be:

0: Home

1: Work

2: School

When appropriate enumerated values for Place are not available in the specification, development codes MAY be used for new applications. These codes SHALL use the format 1xxxx (i.e. integers in the range 10000 to 19999.

Where journeys are being recorded the location in this field SHALL be the starting location. The displacement of the journey can be recorded in an extension field and/or the final location MAY be recorded in a subsequent Atom.

## Who

Who the event relates to:

Name: “Who”

Required: Yes

Value: An object with exactly one of the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| DeviceID | String | Pseudonymous Key of the device that MUST be registered with a Consumer ID | Yes if Consumer ID is not present |
| ConsumerID | String | Pseudonymous Key for the consumer, subject, user or patient. | Yes if Device ID is not present |

The format of valid strings for ConsumerID and DeviceID are defined in [COEL**\_IDA-1.0].**

## Consent

A summary of the consent given by the Consumer for management purposes:

Name: “Consent”

Required: No

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| Jurisdiction | String | Two letter country code: The jurisdiction in which consent was given. Alpha-2 representation as defined in **[ISO 3166]**. | No |
| ConsentDate | Integer | The date of the last explicit consent – nominally, the atom’s time plus the retention period. Seconds since 1970/01/01 00:00Z (Unix timestamp in UTC). | Yes, if the parent element (Consent) is present. |
| RetentionPeriod | Integer | The number of days stated in the consent for retention or review of retention. (Note browsers can retain for milliseconds.) | Yes, if the parent element (Consent) is present. |
| Purpose | Integer | Purposes for which consent has been given.  Enumerated field defined in Appendix B of **[MVCR-v0.7.9] combined using Boolean OR** . Valid bits are 1 through 16. | Yes, if the parent element (Consent) is present. |
| PolicyURL | String, HTTP URL | The privacy policy and notice of the original consent agreement. | No |
| WebTokenID | String | The unique Identifier for JSON Web Token representing the consent receipt. | Yes, if Receipt Service element is present. |
| ReceiptService | String, HTTP URL | The URL of the processing service providing the consent receipt. | Yes, if the Web TokenID element is present. |

The object names and format are defined to be compatible with **[MVCR-v0.7.9]** where possible. The use of a consent receipt as defined by **[MVCR-v0.7.9]** is also possible by generating a “Service/Legal/Consent/Granting consent” atom at the point of original consent agreement and including the WebTokenID and ReceiptService fields.

The standard Purposes are defined in **[MVCR-v0.7.9]** but are reproduced below in COEL nomenclature for convenience only:

1. *Core Function* : To enable the Operator & Service Provider to carry out the core functions of its site/app/services.
2. *Contracted Service* : To provide contracted or requested services to the Consumer.
3. *Delivery*: To deliver contracted or requested services to the Consumer.
4. *Contact Requested* : Communicating with the Consumer about information or services the Consumer specifically request.
5. *Personalized Experience* : Providing the Consumer with a personalised experience of the site/app/service.
6. *Marketing* : Communicating with the Consumer about our other services they may be interested in.
7. *Marketing Third Parties* : Communicating with the Consumer about the services of third parties they may be interested in.
8. *Disclosure for Delivery* : Providing the information to third parties to deliver services on the Operator’s & Service Provider’s behalf.
9. *Disclosure for Marketing* : Providing the information to third parties to enable them to communicate with the Consumer about their services that the Consumer may be interested in.
10. *3rd Party Disclosure for Core Function* : Providing the information to third parties to enable them to deliver or improve their own services to the Consumer.
11. *3rd Party Disclosure to Improve Performance* : Providing the information to third parties to enable them to deliver or improve their own services to others.
12. *Legally Required Data Retention* : Complying with legal obligations for record keeping.
13. *Required by Law Enforcement or Government* : Complying with legal obligations to provide the information to law enforcement or other regulatory/government bodies.
14. *Protecting Health* : Protecting the Consumer’s vital and health interests.
15. *Protecting Interests* : Protecting the Operator’s & Service Provider’s legitimate interests, the Consumer’s or those of a third party.
16. *Improve Performance* : Measure or improve Operator & Service Provider performance or the delivery of services.

## Extension

Additional information about the event:

Name: “Extension”

Required: No

Value: An object with the following elements

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Value** | **Description** | **REQUIRED** |
| ExtIntTag | Integer | Extension tag for integer extension | No |
| ExtIntValue | Integer | Value of extension annotation | Yes, if ExtIntTag present |
| ExtFltTag | Integer | Extension tag for float extension | No |
| ExtFltValue | Float | Value of extension annotation | Yes if ExtFltTag present |
| ExtStrTag | Integer | Extension tag for string extension | No |
| ExtStrValue | String | Value of extension annotation | Yes if ExtStrTag present |

Some proposed tags and values SHALL be (values can be either integer or float depending on the precision available/needed):

1001 Resting heart rate bpm

1002 Average heart rate bpm

1003 Maximum heart rate bpm

1004 Blood pressure Encoded (SSSDDD) as a string?

1005 Weight kg

1006 Respiratory rate bpm

1007 Lung capacity cl

1008 Temperature C

1009 Oxygen saturation %

1010 Calories ingested kcal

1011 Calories burned kcal

1012 Steps taken count

1013 Distance km

1014 Climb m

1015 Body fat %

1016 Metabolic equivalent MET

1017 Water intake cl

When appropriate Extension tags are not available in the specification, development codes MAY be used for new applications. These codes SHALL use the format 1xxxx (i.e. integers in the range 10000 to 19999.

## Examples (non-normative)

The following is an example Behavioural Atom for the activity: ‘Housework’, ‘Dishes’, ‘Loading and unloading the dishwasher’, ‘Load the dishwasher’; the time is accurate to +/- 1 minute; it took place at a given postcode, it was reported by the user with a 100% certainty of the ‘Who’ field and a general ‘Reliability’ of 70%, the social context was with a partner.

{

"Header":{"Version":[1,0,0,0]},

"Who":{"ConsumerID":"5a702670-ff63-4d1d-ba9d-077dd345ab62"}

"What":{"Cluster":4,"Class":4, "SubClass":1,"Element":4},

"When":{"Accuracy":1,"Time":1423515660,"Duration":437},

"Where":{"Postcode":"UB4 8FE"},

"How":{"How":9,"Certainty":100,"Reliability":70},

"Context":{"Social":4},

}

The following is an example Behavioural Atom for the activity: ‘Travel’, ‘Non Powered’, ‘Travelling by bicycle’, ‘Racing bike’; the time is exact; it started at the given latitude and longitude, it was reported by the user, and an application specific extension indicated that 26.2 km had been travelled.

{

"Header":{"Version" : [1,0,0,0]},

"Who": {"ConsumerID" : "5a702670-ff63-4d1d-ba9d-077dd345ab62"},

"What": {"Cluster" : 22,

"Class" : 1,

"SubClass" : 1,

"Element" : 2},

"When": {"Timezone" : "-01:00",

"Accuracy" : 0,

"Time" : 1433397180,

"Duration" : 3903},

"Where": {"Exactness" : 6,

"Latitude" : 51.53118159161092,

"Longitude" : -0.4319647327069491},

"How": {"How" : 9},

"Extension":{"ExtFltTag":10003,

"ExtFltValue":26.2},

}

# Conformance

A Data Engine interface for receiving Behavioural Atoms conforms if it meets the conditions set out in Section 2 of this document AND the conformance criteria in [COEL\_RPE-1.0]

A Behavioural Atom is correctly formatted if it conforms to the conditions set out in Section 3.

1. Acknowledgments

The following individuals have participated in the creation of this specification and are gratefully acknowledged:

Participants:

Paul Bruton, Individual Member

Joss Langford, Activinsights

Matthew Reed, Coelition

David Snelling, Fujitsu

1. Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision** | **Date** | **Editor** | **Changes Made** |
| 1 | 22/9/2015 | Joss Langford | First full version |
| 2 | 25/9/2015 | Joss Langford | Correction of basic mistakes and omissions. |
| 3 | 13/10/2015 | Paul Bruton | Conformance includes reference to RPE document. |
| 4 | 19/10/2015 | David Snelling | Dealt with SHALL, MAY, and MUST and added examples. |
| 5 | 26/10/2015 | David Snelling | Minor updates to examples. |
| 6 | 31/10/2015 | Joss Langford | Accept all changes, track changes off, check references and style consistency. |
| 7 | 31/10/2015 | Joss Langford | Change history corrected. |
| 8 | 02/11/2015 | David Snelling | Final date change |
| 9 | 03/11/2015 | Paul Bruton | Typographic change following review. |
| 10 | 25/11/2015 | Joss Langford | Fix issue COEL-51: contingent requirements added to use of COEL layers in 3.4. |
| 11 | 25/11/2015 | David Snelling | Set date for CD publication |
| 12 | 07/01/2016 | Paul Bruton | COEL-42 clarification of response codes and updated to WD02 |
| 13 | 21/01/2016 | David Snelling | Checked Paul’s edits and accepted changes. |
| 14 | 02/01/2016 | Joss Langford | Development field options added for COEL model, place & extension tags (COEL-50). |
| 15 | 02/01/2016 | Paul Bruton | Minor typographic corrections. Clarified that scheme 1 is minimum required and made authentication with scheme 2 mandatory. |
| 16 | 21/02/2016 | Joss Langford | Checked Paul’s edits and accepted changes. |
| 17 | 21/02/2016 | Joss Langford | Consent fields added (COEL-54). |
| 18 | 16/05/2016 | David Snelling | Revised consent section (COEL-54) |
| 19 | 27/05/2016 | Paul Bruton | Comments/questions on consent (COEL-54) |
| 20 | 27/05/2016 | David Snelling | Tidying requires fields for consent element. |
| 21 | 17/06/2016 | David Snelling | Removed change tracking. |
| 22 | 5/07/2016 | Joss Langford | Version numbering updated (COEL-57)  Consent field updated (COEL-67)  Mobile cell removed from where (COEL-69)  what3words code added to where (COEL-65) |
| 23 | 09/08/2016 | David Snelling | Accepted some change tracking and made a few other changes. |
| 24 | 10/08/2016 | David Snelling | Added status field to Data Engine information request, COEL-68. |
| 25 | 14/08/2016 | Joss Langford | Cluster range extended (COEL-72).  Checked and changes accepted. |
| 26 | 27/09/2016 | David Snelling | Final review: Corrected spelling on artefact and behaviour, missing plural in 3.3, updated the ToC, fixed formatting in table 3.1, deleted ‘between’ in Exactness value 14, fixed format of extension code in second example, and accepted all tracked changes.  Substantive change: Exactness value 0 was mobile phone tower attached to device. Replaced with unknown. |