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Addressing – Digital interchange models

THE CALENDARING AND SCHEDULING CONSORTIUM
TC VCARD

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CALCONNECT STANDARD

WORKING DRAFT

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FOREWORD

The Calendaring and Scheduling Consortium (“CalConnect”) is a global non-profit organization with the aim to facilitate interoperability of collaborative technologies and tools through open standards.

CalConnect works closely with international and regional partners, of which the full list is available on our website (<https://www.calconnect.org/about/liaisons-and-relationships>).

The procedures used to develop this document and those intended for its further maintenance are described in the CalConnect Directives.

In particular the different approval criteria needed for the different types of CalConnect documents should be noted. This document was drafted in accordance with the editorial rules of the CalConnect Directives.

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This document was prepared by Technical Committee *VCARD*.

INTRODUCTION

Addresses are among the most commonly exchanged information on the Internet, and the interchange of them is crucial to a number of Internet applications, such as electronic commerce, contact exchange, non-postal deliveries, as well as location scheduling.

Yet, addresses can mean much more than just geolocation information:

- As an identity, such as an office address
- As reference points (waypoints) in routing information
- As a delivery point

The interchange of addresses require a common structure of address data. For instance of a software application in need of user input of address information, users need assistance from the application to enter the correct format and structure of the address for it to be machine readable and interoperable among different machines or systems which process the address data.

This document focuses on enabling software applications the digital interchange of address profiles, address instances and instructions for their input and display, together with model definitions and a registry mechanism to ensure they are publicly available.

This standard complements the other parts in the family of ISO 19160 standards:

- [ISO 19160-1](#) describes conceptual models for addressing that allow specification of international address profiles. This International Standard further provides methods to utilize these models in a way suitable for electronic interchange.
- [ISO 19160-4](#) defines key terms for postal addressing, postal address components and constraints on their use. It focuses on use cases for postal applications, specifying the methods to write or detect addresses on mail items. This International Standard adapts models from [ISO 19160-1](#) as address interchange models, to facilitate interchange and interaction of addresses between humans and applications, and between applications, and for applications to interact and interchange international addresses, while supporting human input and human-machine interaction, without loss of fidelity.
- ISO 19160-5 describes how to represent addresses on different devices. It targeted on all addresses but was concluded to be too complex. This standard, ISO 19160-6, therefore, focuses on providing a standard way of interchanging profiles of addresses, resulting in compliant addresses to be interoperable among humans, devices and systems. This standard further defines an interchange profile for addresses suitable for interchange, so that compliant addresses can be input and display in a standard way among different applications which use the address data.

The lifecycle of an address entry exchanged on the Internet typically starts with manual input of a human actor. This data, structured or unstructured, is then submitted to an Internet-connected application, and the application may in turn transmit this information

to other applications or external parties on behalf of the user who provided the address. This transmission is usually performed to fulfil service delivery to the user. Within the process, there may be machine-human interactions that require display of the address in human-readable form, as well as machine-to-machine interactions on the address, such as for data validation.

Additional caution shall be placed on the accuracy (or lack thereof) of human input addresses. While an address specified by a human actor may unambiguously distinguish a location, there may be intention or unintentional omissions or additions to an “official” address (if there was one).

Addressability, and features provided within the object which the address points to, is not described in this document. Specifically, the `AddressableObject` from [ISO 19160-1](#) is considered out of scope. The `AddressableObject` model is considered orthogonal to models in this document, but can easily be used together, for example, in a navigation map where an address points to an addressable object, which in turn provides a list of its extant facilities.

1. SCOPE

This document specifies a set of data models suitable for machine encoding of the digital storage and transmission of address information, called the “Address Interchange Object” (“AXO”) models, and describes the usage of them.

Specifically, this document provides:

- data models for the interchange of address profiles conforming to [ISO 19160-1](#) (*Addressing – Part 1: Conceptual model*)
- data models for the interchange of address instances conforming to a specific profile of [ISO 19160-1](#), *Addressing – Part 1: Conceptual model*
- data models for entry and display templates for entering and displaying address instances conforming to the profile and encoding rules above; and
- the management and operations of a register of address profiles conforming to [ISO 19160-1](#), *Addressing – Part 1: Conceptual model*.

2. NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- ISO 19160-1, *Addressing – Part 1: Conceptual model*
- ISO 19103, *Geographic information – Conceptual schema language*
- ISO 19106, *Geographic information – Profiles*
- ISO 19115-1, *Geographic information – Metadata – Part 1: Fundamentals*
- ISO 19157, *Geographic information – Data quality*
- ISO 19135-1, *Geographic information – Procedures for item registration – Part 1: Fundamentals*

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in [ISO 19160-1](#) and the following apply.

3.1. lineage

provenance, source(s) and production process(es) used in producing a resource

[SOURCE: [ISO 19115-1](#), [Clause 4.9](#)]

3.2. locale

definition of the subset of a user's environment that depends on language and cultural conventions

[SOURCE: [ISO/IEC/IEEE 9945](#), [Clause 4.211](#), modified – The notes given in [ISO/IEC/IEEE 9945](#) for this entry have been omitted.]

3.3. profile

set of one or more base standards or subsets of base standards, and, where applicable, the identification of chosen clauses, classes, options and parameters of those base standards, that are necessary for accomplishing a particular function

[SOURCE: [ISO 19106](#), [Clause 4.5](#)]

3.4. provenance

organization or individual that created, accumulated, maintained and used records

3.5. data type

specification of a value domain with operations allowed on values in this domain

[SOURCE: [ISO 19103](#), [Clause 4.14](#)]

3.6. primitive data type

A data type that has no super type. The primitive data type of a data type is the data type itself, if the data type has no super type, and otherwise the primitive data type of the super type of the data type.

[SOURCE: ISO/IEC 10179, Clause 4.23]

3.7. user defined data type

data type (Clause 3.5) defined by the user in an interchange address profile through the composure of other *data types* (Clause 3.5) and constraints

3.8. user defined data type definition

definition of a *user defined data type* (Clause 3.7)

3.9. address feature

marking on an address instance to indicate what it is capable of

3.10. address layout template

specification of layout and positioning of address components for an interchange address instance of an address class

3.11. address display template

address layout template (Clause 3.10) for the display of interchange address instances of an address class

3.12. address form template

address layout template (Clause 3.10) of an input form for the entry of address instances of an address class

3.13. address processor

entity that processes interchange address instances

3.14. address profile distributor

entity that distributes interchange address profiles

3.15. signature

the string of bits resulting from the signature process

[SOURCE: ISO/IEC 14888-3, Clause 4.15]

3.16. signature key

a secret data item specific to an entity and usable only by this entity in the signature process

[SOURCE: ISO/IEC 14888-3, Clause 4.18]

3.17. verification key

a data item which is mathematically related to an entity's *signature key* (Clause 3.16) and which is used by the verifier in the verification process

[SOURCE: ISO/IEC 14888-3, Clause 4.15]

3.18. object identifier

oid

a value (distinguishable from all other such values) which is associated with an object

[SOURCE: ISO/IEC 15961, Clause 3.1.16]

3.19. language identifier

language symbol

symbol that uniquely identifies a particular language

[SOURCE: ISO 639-3, Clause 3.3]

3.20. script

set of graphic characters used for the written form of one or more languages

[SOURCE: ISO 15924, Clause 3.7]

3.21. script code

combination of characters used to represent the name of a *script* ([Clause 3.20](#))

[SOURCE: ISO 15924, Clause 3.8]

3.22. URI

uniform resource identifier

[SOURCE: ISO 19103, Clause 5.3]

4. CONFORMANCE

4.1. General

This part of ISO 19160-6 defines four classes of requirements and conformance. [Appendix A](#) specifies how conformance with these classes shall be tested.

4.2. Address profile register

To conform to this standard, an address profile register shall satisfy all of the requirements specified for a register in [ISO 19135-1](#). See [Appendix A.2](#).

4.3. AddressProfile

Any machine-readable description of an ISO 19160-6 AddressProfile for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.3](#).

4.4. AddressClassProfile

Any machine-readable description of an ISO 19160-6 AddressClassProfile for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.4](#).

4.5. AddressComponentProfile

Any machine-readable description of an ISO 19160-6 AddressComponentProfile for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.5](#).

4.6. ProfileCompliantAddress

Any machine-readable description of an ISO 19160-6 ProfileCompliantAddress for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.6](#).

4.7. ProfileCompliantAddressComponent

Any machine-readable description of an ISO 19160-6 ProfileCompliantAddressComponent for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.7](#).

4.8. InterchangeAddressClassProfile

Any machine-readable description of an ISO 19160-6 InterchangeAddressClassProfile for which conformance is claimed shall pass all the requirements described in the abstract test suite in [Appendix A.8](#).

4.9. FormTemplate

Any FormTemplate in Interchange Address Profile model for which FormTemplate conformance is claimed shall pass the requirements described in the abstract test suite in [Appendix A.9](#).

4.10. DisplayTemplate

Any DisplayTemplate in Interchange Address Profile model for which DisplayTemplate conformance is claimed shall pass the requirements described in the abstract test suite in [Appendix A.10](#). Unresolved directive in cc-19160-6.adoc - include::sources/sections/04-registry.adoc[] Unresolved directive in cc-19160-6.adoc - include::sources/sections/04-process.adoc[] Unresolved directive in cc-19160-6.adoc - include::sources/sections/05-data-types.adoc[] Unresolved directive in cc-19160-6.adoc - include::sources/sections/06-common-models.adoc[] Unresolved directive in cc-19160-6.adoc - include::sources/sections/07-profile.adoc[]

5. ADDRESS CLASS

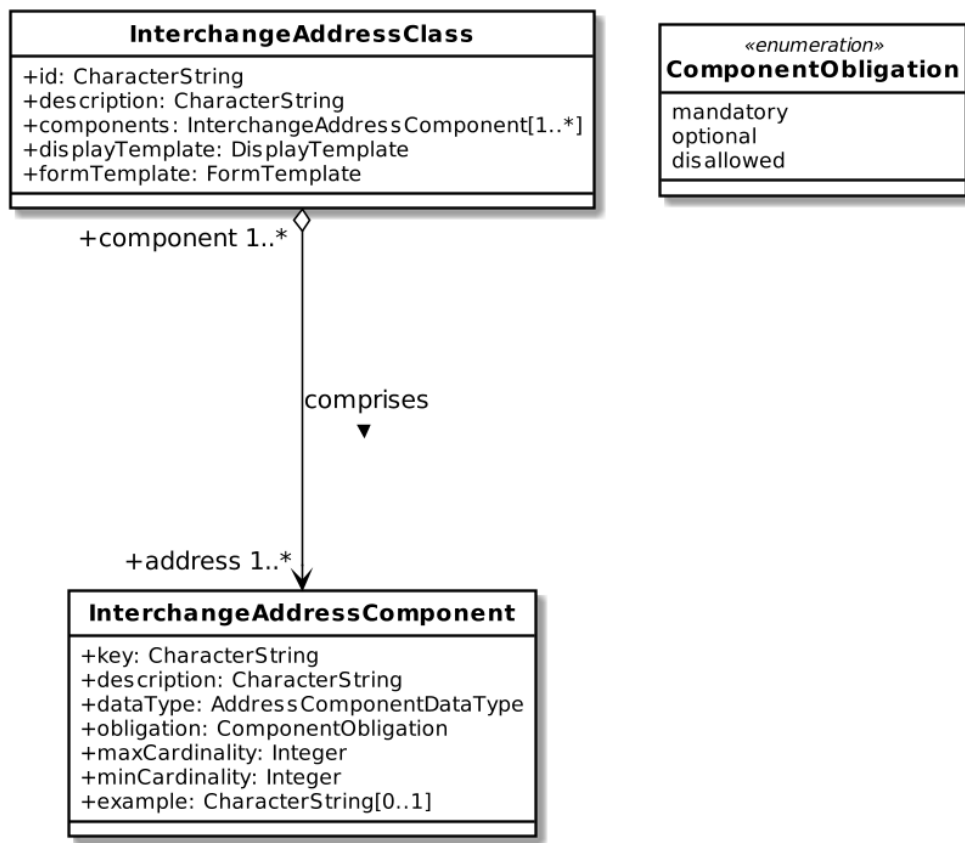


Figure 1 – Interchange address class data model

5.1. InterchangeAddressClass

Interchange address class corresponds to the `addressClass` specified in ISO 19160-1.

A single profile can include and support multiple types of address formats, such as a numbered street address and a “PO Box” address simultaneously. Each of these address formats is represented as an interchange address class.

EXAMPLE

The US Numbered Thoroughfare Address with this syntax can be represented as an interchange address class:

```
* { Complete Landmark Name or Complete Place Name }
* { Complete Address Number * }
* { Complete Street Name * }
* { Complete Subaddress }
* { Complete Place Name * }
* { State Name * }
```


- * { Zip Code }
- * { Zip Plus 4 }
- * { Country Name }

An interchange address class also provides a display template and a form template to allow the display and entry of an address instance of the address class.

Table 1 – InterchangeAddressClass attributes

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
id	Unique identifier of this interchange address class.	M	1	CharacterString
description	Textual description of this interchange address class.	M	1	CharacterString
components	Constituent parts of this interchange address class.	M	N	InterchangeAddressComponent
displayTemplate	The template to instruct how to display an interchange address instance belonging to this interchange address class.	M	1	DisplayTemplate
formTemplate	The template to instruct how to create an input form for applications requiring user input to create an interchange address instance belonging to this interchange address class.	M	1	FormTemplate

5.2. InterchangeAddressComponent

The interchange address component corresponds to the addressComponent defined in ISO 19160-1.

Table 2 – InterchangeAddressComponent attributes

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
key	An identifier of this interchange address component, shall be unique within the interchange address class.	M	1	CharacterString
description	Textual description of this component.	M	1	CharacterString
dataType	Describes the type of value accepted by this component. This takes an <code>AddressComponentDataType</code> value.	M	1	AddressComponentDataType
obligation	Whether this component is mandatory, optional or disallowed. Values represented by the <code>ComponentObligation</code> object.	M	1	ComponentObligation
maxCardinality	The maximum number of components within this address class.	M	1	Integer
minCardinality	The minimum number of components within this address class.	M	1	Integer
example	A textual example to demonstrate the correct use of this component.	O	1	CharacterString

5.3. ComponentObligation

A enumeration value to indicate a component to be mandatory, optional or disallowed.

Table 3 – ComponentObligation values

Name	Definition
mandatory	Indicating that a component must exist.
optional	Indicating that a component can exist.
disallowed	Indicating that a component must not exist.

Unresolved directive in cc-19160-6.adoc - include::sources/sections/09-feature.adoc[]
Unresolved directive in cc-19160-6.adoc - include::sources/sections/10-instances.adoc[]
Unresolved directive in cc-19160-6.adoc - include::sources/sections/11-layout-template.adoc[]
Unresolved directive in cc-19160-6.adoc - include::sources/sections/12-display-template.adoc[]
Unresolved directive in cc-19160-6.adoc - include::sources/sections/13-form-template.adoc[]

APPENDIX A (INFORMATIVE) ABSTRACT TEST SUITES

A.1. Introduction

The abstract test suites for the conformance classes defined by this part of ISO 19160-6 are presented in ??? to [Appendix A.10](#).

A.2. Conformance class: Address profile register

Refer to [ISO 19135-1](#) for requirements.

A.3. Conformance class: AddressProfile

Table A.1 – AddressProfile test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.2 – AddressProfile test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.4. Conformance class: AddressClassProfile

Table A.3 – AddressClassProfile test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.4 – AddressClassProfile test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.5. Conformance class: AddressComponentProfile

Table A.5 – AddressComponentProfile test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.6 – AddressComponentProfile test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.6. Conformance class: ProfileCompliantAddress

Table A.7 – ProfileCompliantAddress test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.8 – ProfileCompliantAddress test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model

Reference	???
Test type	Basic

A.7. Conformance class: ProfileCompliantAddressComponent

Table A.9 – ProfileCompliantAddressComponent test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.10 – ProfileCompliantAddressComponent test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.8. Conformance class: InterchangeAddressClassProfile

Table A.11 – InterchangeAddressClassProfile test 1: Associations

Test purpose	Check that the model contains the associations as specified.
Test method	Inspect the model
Reference	???
Test type	Basic

Table A.12 – InterchangeAddressClassProfile test 2: Attributes

Test purpose	For each instance in the class, check that the instance appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.9. Conformance class: FormTemplate

Table A.13 – FormTemplate test 1: Attributes

Test purpose	For each class and type in the model, check that the model appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

A.10. Conformance class: DisplayTemplate

Table A.14 – DisplayTemplate test 1: Attributes

Test purpose	For each class and type in the model, check that the model appropriately includes the mandatory, optional and conditional attributes.
Test method	Inspect the model
Reference	???
Test type	Basic

APPENDIX B (INFORMATIVE) USAGE

B.1. Accuracy and Verification

An authority, such as the local post office, could “verify” a structured address that it is confirmed that this address instance is a “deliverable address” through an AddressFeature.

The owner of the address, such as the tenant of an office, could provide its signed, structured address on an electronic business card. This allows the recipient of the business card to know whether the senders address is authentic. If this address is verified to be a “deliverable address”, the recipient will know that items sent to this address will very likely be deliverable.

Extra steps need to be taken here to allow this.

B.2. Address As Identity

Addresses do not only specify a location, in some cases they are part of the identity. For example, in business cards, an address can mean more than just an address, such as with vanity value.

This document shall support this functionality for it to be useful in contact exchange.

This address represents a complete textual address instance.

Suites 1107-1111,
Floor 11,
Central Building,
1-3 Pedder Street,
Central,
Central & Western District,
Hong Kong Island,
Hong Kong

And this address represents the identical address as above, with a reduction of information that is already implied, which that does not reduce its correctness. This can be achieved by supplying a displayTemplate in the interchange address instance model.

Suite 1109,
1 Pedder Street,
Central,
Hong Kong

B.3. Address As Destination

In certain cases, an address is expected to be reachable either by person and/or post.

An address instance should support being used in conjunction with routing information, acting as a waypoint, and/or supporting a source-defined route.

For example, written instructions on how to deliver to a place that is unambiguous but terribly difficult to locate.

NOTE E.g., some buildings have split floors – rooms may have the same floor identifier, but is actually inaccessible from the same floor.

APPENDIX C (INFORMATIVE) EXAMPLES OF OBJECTS SPECIFIED IN THIS DOCUMENT

Models specified in this document can be represented in various object structures, including in XML [ISO/TS 19139:2007](#) and in JSON.

C.1. IxAddressProfile

```
{  
  
  "id": "http://www.iso.org/tc211/tc211-sample.adp",  
  "type": "iso-19160-address-profile",  
  "publisher": "http://www.iso.org/tc211/",  
  "signature": "...",  
  
  "name": "TC 211 Minimal Address Profile",  
  "localization": {  
    "language": "en",  
    "script": "en"  
  },  
  
  "area": {  
    "countries": ["uk"]  
  },  
  
  "dataTypes": {  
    "addressedObjectIdentifier": {  
      "primitiveType": "Integer"  
    }  
  },  
  "addressComponents": { ... },  
  "addressClasses": { ... }  
}
```

C.2. IxAddressClass

```
"addressClasses": {  
  "streetAddress": {  
    "description": "Street Address",  
    "availableFields": [ (addressComponent) 1..* ... ],  
    "displayTemplate": { ... },  
    "formTemplate": { ... }  
  }  
}
```

C.3. Validity

```
"validity": {  
  "validFrom": "20171129Z000000",  
  "validTo": "20191129Z000000"  
}
```

C.4. PublisherInformation

```
"publisher": {  
  "publisherName": "UK Post Office",  
  "publisherUri": "https://www.postoffice.co.uk"  
}
```

C.5. LocalizationInformation

```
"publisher": {  
  "language": "en",  
  "script": "Latn"  
}
```

C.6. Signature

```
"signature": {  
  "algorithm": "1.2.3.4.5.6.7.8.9",  
  "publicKey": "https://www.postoffice.co.uk/profile-signature.key",  
  "signature": "BOLVMNoGNM1TLglnlxgm0a9t"  
}
```

C.7. IxAddressClass

```
"addressClassDescription": {  
  "id": "streetAddress",  
  "description": "A typical street address",  
  "addressComponents": [ ... ],  
  "displayTemplate": { ... },  
  "formTemplate": { ... },  
}
```

C.8. User Defined Data Types

```
"dataTypes": [{  
  "name": "addressNumberValue",  
  "coreType": "Integer",  
}
```

```
"constraints": [ ... ],  
]]
```

C.9. Data Type Constraints

```
"constraints": [{  
  "maxValue": 10000,  
  "minValue": 1  
}]
```

C.10. IxAddressComponent

```
"addressComponentDescription": {  
  "key": "addressNumber",  
  "description": "Street number",  
  "datatype": "addressNumberValue"  
}
```

C.11. IxAddressInstance

```
"addressInstance": {  
  "profileId": "https://standards.iso.org/19160/-6/profiles/uk.adp",  
  "components": [ ... ],  
  "signature": { ... },  
  "cap": [ ... ]  
}
```

C.12. IxAddressInstanceComponent

```
"addressComponentInstance": {  
  "type": "addressNumber",  
  "values": [ 1001 ]  
}
```

C.13. AddressFeature

```
"addressFeature": {  
  "feature": "https://standards.iso.org/19160/-6/features/specified",  
  "signature": [ ... ]  
}
```

C.14. DisplayTemplate

```
DisplayTemplate: {  
  ...  
}
```

C.15. Form template (FormTemplate)

```
FormTemplate: {  
  ...  
}
```

APPENDIX D (INFORMATIVE) EXAMPLES

D.1. Example of address profiles defined in ISO 19160-1

D.1.1. ISO 19160-1 C2

```
profile = {  
  
  "id": "http://www.iso.org/tc211/tc211-minimal.adp",  
  "type": "iso-19160-address-profile",  
  "publisher": "http://www.iso.org/tc211/",  
  "signature": "...",  
  
  "name": "TC 211 Minimal Address Profile",  
  "locale": {  
    "language": "en",  
    "script": "en",  
  },  
  
  "addressComponents": {  
    "addressLine": {  
      "dataType": "CharacterString",  
      "minCardinality": 1  
    },  
  },  
  
  "addressClasses": {  
    "minimalAddress": {  
      "availableFields": [  
        {  
          "componentType": "addressLine",  
          "min": 1,  
          "description": "One line of this address",  
          "require": true  
        }  
      ],  
      "displayTemplates": [  
        {  
          /* TODO */  
          "orientation": "horizontal",  
          "text": "(\n)*"  
        }  
      ]  
    }  
  }  
}
```

```
}  
}
```

Address Instance

```
addressInstance1 = {  
  "profile": "http://www.iso.org/tc211/tc211-minimal.adp",  
  "components": [  
    {  
      "type": "addressLine",  
      "value": "14 Church Street"  
    },  
    {  
      "type": "addressLine",  
      "value": "Hatfield"  
    },  
    {  
      "type": "addressLine",  
      "value": "South Africa"  
    }  
  ]  
}  
  
addressInstance2 = {  
  "profile": "http://www.iso.org/tc211/tc211-minimal.adp",  
  "components": [  
    {  
      "type": "addressLine",  
      "value": "Statue of Liberty"  
    },  
    {  
      "type": "addressLine",  
      "value": "Liberty Island"  
    },  
    {  
      "type": "addressLine",  
      "value": "New York"  
    },  
    {  
      "type": "addressLine",  
      "value": "NY"  
    }  
  ]  
}
```

```

profile = {

    "id": "http://www.iso.org/tc211/tc211-sample.adp",
    "type": "iso-19160-address-profile",
    "publisher": "http://www.iso.org/tc211/",
    "signature": "...",

    "name": "TC 211 Minimal Address Profile",
    "locale": {
        "language": "en",
        "script": "en",
    },

    "dataTypes": {
        "addressNumberValue": {
            "primitiveType": "Integer",
            "maxValue": 10000,
            "minValue": 1
        },
        "boxNumberValue": {
            "primitiveType": "Integer",
            "maxValue": 100000,
            "minValue": 1
        }
    }

    "addressComponents": {
        "addressNumber": {
            "dataType": "addressNumberValue"
        },
        "boxNumber": {
            "dataType": "boxNumberValue"
        },
        /* Table C.4. Address component type */
        "thoroughfareName": {
            "dataType": "thoroughfareNameValue"
        },
        "localityName": {
            "dataType": "CharacterString"
        },
        "postOfficeName": {
            "dataType": "CharacterString"
        },
        "postCode": {
            "dataType": "CharacterString"
        }
    }
}

```



```

    },
    "countryName": {
      "dataType": "thoroughfareName"
    }
  },
  "addressNumber": {
    "dataType": "addressedObjectIdentifier"
  }
},

"addressClasses": {
  "streetAddress": {
    "description": "Street Address",
    "availableFields": [
      {
        "componentType": "addressNumber",
        "minCardinality": 1,
        "maxCardinality": 1,
        "required": true
      },
      {
        "componentType": "thoroughfareName",
        "minCardinality": 1,
        "maxCardinality": 1,
        "required": true
      },
      {
        "componentType": "placeName",
        "dataType": CharacterString,
        "minCardinality": 1,
        "maxCardinality": 1,
        "required": true
      },
      {
        "componentType": "postCode",
        "minCardinality": 1,
        "maxCardinality": 1,
        "required": true
      },
      {
        "componentType": "countryName",
        "minCardinality": 1,
        "maxCardinality": 1,
        "required": false,
      },
    ],
    "displayTemplates": [
      {

```



```

        "type": "addressNumber",
        "value": "99"
    },
    {
        "type": "thoroughfareName",
        "value": {
            "name": "Lombardy",
            "type": "Street"
        }
    },
    {
        "type": "placeName",
        "value": "The Hills"
    },
    {
        "type": "postCode",
        "value": "0039"
    },
    {
        "type": "countryName",
        "value": "South Africa"
    }
]
}

boxInstance1 = {
    "profile": "http://www.iso.org/tc211/tc211-sample.adp#boxAddress",
    "components": [
        {
            "type": "boxNumber",
            "value": "345"
        },
        {
            "type": "postOfficeName",
            "value": "Orlando"
        },
        {
            "type": "postCode",
            "value": "2020"
        },
        {
            "type": "countryName",
            "value": "South Africa"
        }
    ]
}

```


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