Emergency Data Exchange Language (EDXL) GML Simple Features Profile Version 1.0

Committee Specification Draft 01

13 September 2011

Specification URIs

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Additional artifacts:

This prose specification is one component of a Work Product which also includes:

- XML schemas:http://docs.oasis-open.org/emergency/edxl-gsf/v1.0/csd01/xsd/

Declared XML namespace:

- urn:oasis:names:tc:emergency:edxl:gsf:1.0

Abstract:

This EDXL Geography Markup Language (GML) Simple Features Profile describes components and component types that can be reused across the suite of Emergency Data Exchange Language (EDXL) standards. These common components and types are intended for internal use by the Emergency Management Technical Committee and its subcommittees as they develop specific standards utilizing these types.

Status:

This document was last revised or approved by the OASIS Emergency Management TC on the above date. The level of approval is also listed above. Check the “Latest version” location noted above for possible later revisions of this document.

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When referencing this Work Product the following citation format should be used:
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Table of Contents

1 Introduction

This document describes geospatial components and component types that can be reused across the suite of Emergency Data Exchange Language (EDXL) standards. This document is intended for internal use by the Emergency Management Technical Committee and its subcommittees as they develop specific standards utilizing these types. The goal is to enable reuse of components which are commonly used in specifications and which have been designed based on lessons learned from the development of the Common Alert Protocol 1.1, the Distribution Element 1.0, Hospital Availability and Resource Messaging. The first use of these common components is intended to be in Situation Reports 1.0 and the Distribution Element 2.0. The components will be used and expanded as needed for future EDXL specifications.

1.1 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]**.

1.2 Normative References

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

[WGS 84] National Geospatial Intelligence Agency, Department of Defense World Geodetic System 1984, http://earth-info.nga.mil/GandG/tr8350_2.html, NGA Technical Report TR8350.2, January 2000.

[XML 1.0] T. Bray, Extensible Markup Language (XML) 1.0 (Third Edition), http://www.w3.org/TR/REC-xml/, W3C REC-XML-20040204, February 2004.

[ISO 19107] ISO 19107:2003 Geographic information — Spatial schema.

[OGC GML] OpenGIS® Geography Markup Language (GML) Encoding Standard, OGC® 07-036, Version 3.2.1, October 2005.

[OGC SF] OpenGIS® Implementation Standard for Geographic information - Simple feature access - Part 1: Common architecture, OGC® 06-103r4, Version 1.2.1, 4 August 2010.

[OGC GML-SF] OpenGIS® Implementation Standard Profile for Geography Markup Language (GML) simple features profile, OGC® 10-100r2, Version 2.0, 7 October 2010

[OGC GML-SF] Geography Markup Language (GML) simple features profile Technical Note OGC® 11-044, Version 2.0, 11 May 2011.

[OGC-OASIS-SF] C. Reed, OGC® 2009 September OASIS where GML profile requirements v 2, http://www.oasis-open.org/apps/org/workgroup/emergency/download.php/34853/2009%20September%20OASIS%20where%20GML%20profile%20requirements%20v%202.doc

[namespaces] T. Bray, Namespaces in XML, http://www.w3.org/TR/REC-xml-names/, W3C REC-xml-names-19990114, January 1999.

[dateTime] N. Freed, XML Schema Part 2: Datatypes Second Edition, http://www.w3.org/TR/xmlschema-2/#dateTime, W3C REC-xmlschema-2, October 2004.

1.3 Non-Normative References

[EDXL GFR] *EDXL General Functional Requirements*, http://www.oasis-open.org/committees/document.php?document_id=10031&wg_abbrev=emergency, November 2004.

[EDXL-DE IG] *EDXL Distribution Element Implementer's Guide*, http://www.oasis-open.org/committees/document.php?document_id=14120&wg_abbrev=emergency, August 2005.

2 Design Principles & Concepts (non-normative)

2.1 Requirements

This EDXL GML Simple Features Profile is based on GML Version 3.2.1, which is an OGC standard that has also been approved by ISO TC 211 as an International Standard.

This profile will be maintained as an OASIS document based on the OGC GML standard that would be normatively referenced by OASIS standards.

The requirements which form the non-normative basis for this initial version of the EDXL GML Simple Features Profile are contained in [OGC-EDXL-SF] (OGC® 09-181 Requirements for an OASIS GML Profile, v0.3.0 dated 2 December 2009). It contains comments received during a public comment period as well as additional requirements identified as part of the CAP profiling activity and other EDXL discussions.[OGC-EDXL-SF] provides the basis for this current draft EDXL GML Simple Features profile document.

2.2 Design Philosophy

Below are some of the guiding principles of the EDXL Simple Features:

1. Provide a method to capture and reuse location-based xml types and elements which are commonly needed across multiple EDXL standards.

2. Provide flexible mechanisms to update the common types efficiently, without slowing down the EDXL standards development process.

3. Allow for easy updates to capture fixes or improvements.

4. Capture common components resulting from significant thought and expertise, so new standards efforts do not have to reinvent the wheel and/or suffer from making the same mistake twice.

5. Speed the development of EDXL Standards through reuse of common components and thereby improve information sharing and data exchange across the local, state, tribal, national and non-governmental organizations of different professions that provide emergency response and management services

6. Support the integration of data elements from profiles which enables efficient and effective reuse of other important open standards.

WGS 84 is the preferred default Coordinate Reference System (CRS). However, additional CRS's may be stated for cases in which national or regional policies, such as in China and India, dictate that other CRS/datums be used.

3 EDXL Simple Features Structure (normative)

3.1 Data Dictionary

3.1.1 EDXL GML Simple Features Elements and Types

Namespaces and prefixes used below include:

```
edxl-gsf="urn:oasis:names:tc:emergency:edxl:gsf:1.0"
gml="http://www.opengis.net/gml/3.2"
gmlsf="http://www.opengis.net/gmlsf/2.0"
```

Element	**EDXLGeoLocation**
Type	EDXLGeoLocationType
Usage	Used to represent a geographic location
Definition	
Comments	1.
Schema	edxl-gsf.xsd
Schema Component	<xs:element name="EDXLLocation" type="edxl-gsf:EDXLLocationType"/>
Used In	Application specific component
Examples	

Type	**EDXLGeoLocationType**
BaseType	
Restriction	None
Usage	Used to represent location by one of the following GML geometric elements: • Point • CircleByCenterPoint • Polygon • Envelope • LineString
Definition	A multipurpose type which allows choice of one of several geometric element types to best suit the application requirement. This type is intended for use where a geographic location must be represented by coordinates defined in a coordinate reference system (ex. Lat / long in WGS 84)
Comments	1.
Schema	edxl-gsf.xsd

Type	EDXLGeoLocationType
Schema Component	<xs:complexType name="EDXLLocationType"> <xs:choice> <xs:element ref="gml:Point" maxOccurs="1"/> <xs:element ref="gml:CircleByCenterPoint" maxOccurs="1"/> <xs:element ref="gml:Polygon" maxOccurs="1"/> <xs:element ref="gml:Envelope" maxOccurs="1"/> <xs:element ref="gml:LineString" maxOccurs="1"/> </xs:choice> </xs:complexType>
Used In	EDXLGeoLocation

Element	Point
Type	gml:PointType
Usage	Use to identify a geographic point (may also include altitude)
Definition	A Point is defined by a single coordinate tuple. The direct position of a point is specified by the pos element which is of type DirectPositionType.
Comments	2. A point may be specified using either WGS 84 (latitude, longitude) or WGS 84 (latitude, longitude, altitude).
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd
Schema Component	<element name="Point" type="gml:PointType" substitutionGroup="gml:AbstractGeometricPrimitive"> <annotation> <documentation> A Point is defined by a single coordinate tuple. The direct position of a point is specified by the pos element which is of type DirectPositionType. </documentation> </annotation> </element>
Used In	Application specific component
Examples	WGS 84 (latitude, longitude): <gml:Point srsName="urn:ogc:def:crs:EPSG::4326" xmlns:gml="http://www.opengis.net/gml"> <gml:pos>45.256 -71.92</gml:pos> </gml:Point> WGS 84 (latitude, longitude, altitude): <gml:Point srsName="urn:ogc:def:crs:EPSG::4979" xmlns:gml="http://www.opengis.net/gml"> <gml:pos>-34.407 150.883 24.8</gml:pos> </gml:Point>

Type	PointType
BaseType	Extension of `gml: AbstractGeometricPrimitiveType`
Restriction	None
Usage	Use to identify a geographic point (may also include altitude)
Definition	A Point is defined by a single coordinate tuple. The direct position of a point is specified by the pos element which is of type DirectPositionType.
Comments	2. latitude and longitude values are separated by a space and are provided in that order
Schema	`edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd`
Schema Component	`<complexType name="PointType"> <complexContent> <extension base="gml:AbstractGeometricPrimitiveType"> <sequence> <element ref="gml:pos"/> </sequence> </extension> </complexContent> </complexType>`
Used In	Point or semantically equivalent component

Element	LineString
Type	`gml:LineStringType`
Usage	Use to depict a linear connection between two direct positions
Definition	A LineString is a special curve that consists of a single segment with linear interpolation. It is defined by two or more coordinate tuples, with linear interpolation between them. The number of direct positions in the list shall be at least two.
Comments	1. Application must specify whether directionality is implied in the coordinate sequence of a linestring
Schema	`edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd`
Schema Component	`<element name="LineString" type="gml:LineStringType" substitutionGroup="gml:AbstractCurve"> <annotation> <documentation> A LineString is a special curve that consists of a single segment with linear interpolation. It is defined by two or more coordinate tuples, with linear interpolation between them. The number of direct positions in the list shall be at least two. </documentation> </annotation> </element>`
Used In	Application specific component

Element	LineString
Examples	<gml:LineString> <gml:posList> 45.256 -110.45 46.46 -109.48 43.84 -109.86 </gml:posList> </gml:LineString>

Type	LineStringType
BaseType	Extension of gml:AbstractCurveType
Restriction	This profile shall restrict LineString to being simple; that is a simple LineString does not overlap or repeat on itself
Usage	Use to depict a linear connection between two direct positions
Definition	A LineString is a special curve that consists of a single segment with linear interpolation. It is defined by two or more coordinate tuples, with linear interpolation between them. The number of direct positions in the list shall be at least two.
Comments	1.
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd
Schema Component	<complexType name="LineStringType"> <complexContent> <extension base="gml:AbstractCurveType"> <sequence> <choice> <element ref="gml:pos" minOccurs="2" maxOccurs="un-bounded" /> <element ref="gml:posList"/> </choice> </sequence> </extension> </complexContent> </complexType>
Used In	LineString or semantically equivalent component

Element	CircleByCenterPoint
Type	gml:CircleByCenterPointType
Usage	
Definition	A gml:CircleByCenterPoint is an gml:ArcByCenterPoint with identical start and end angle to form a full circle. Again, this representation can be used only in 2D.
Comments	1.
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryPrimitives.xsd

Element	CircleByCenterPoint
Schema Component	<element name="CircleByCenterPoint" type="gml:CircleByCenterPointType" substitutionGroup="gml:ArcByCenterPoint"> <annotation> <documentation> A gml:CircleByCenterPoint is an gml:ArcByCenterPoint with identical start and end angle to form a full circle. Again, this representation can be used only in 2D. </documentation> </annotation> </element>
Used In	Application specific component
Examples	<gml:Curve gml:id="c01" srsName="http://www.opengis.net/def/crs/EPSG/0/4326"> <gml:segments> <gml:CircleByCenterPoint numArc="1"> <gml:pos>50.717 7.086</gml:pos> <gml:radius uom="m">20</gml:radius> </gml:CircleByCenterPoint> </gml:segments> </gml:Curve>

Type	CircleByCenterPointType
BaseType	Restriction of gml:ArcByCenterPointType
Usage	
Definition	A gml:CircleByCenterPoint is an gml:ArcByCenterPoint with identical start and end angle to form a full circle. Again, this representation can be used only in 2D.
Comments	1.
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryPrimitives.xsd
Schema Component	<complexType name="CircleByCenterPointType"> <complexContent> <restriction base="gml:ArcByCenterPointType"> <sequence> <choice> <element ref="gml:pos"/> <element ref="gml:posList"/> </choice> <element name="radius" type="gml:LengthType"/> </sequence> </restriction> </complexContent> </complexType>
Used In	CircleByCenterPoint or semantically equivalent component

Element	Polygon
Type	gml:PolygonType
Restriction	None
Usage	
Definition	A planar **surface** defined by 1 **exterior boundary** and 0 or more **interior boundaries**. A Polygon is a special surface that is defined by a single surface patch (see D.3.6 in [ISO 19107] ISO 19107:2003 Geographic information — Spatial schema.). The boundary of this patch is coplanar and the polygon uses planar interpolation in its interior. The elements exterior and interior describe the surface boundary of the polygon.
Comments	1.
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic2d.xsd
Schema Component	<element name="Polygon" type="gml:PolygonType" substitutionGroup="gml:AbstractSurface"> <annotation> <documentation> A Polygon is a special surface that is defined by a single surface patch (see D.3.6). The boundary of this patch is coplanar and the polygon uses planar interpolation in its interior. The elements exterior and interior describe the surface boundary of the polygon. </documentation> </annotation> </element>
Used In	Application specific component
Examples	<gml:Polygon> <gml:exterior> <gml:LinearRing> <gml:posList> 45.256 -110.45 46.46 -109.48 43.84 -109.86 45.256 -110.45 </gml:posList> </gml:LinearRing> </gml:exterior> </gml:Polygon>

Type	PolygonType
BaseType	gml:AbstractSurfaceType
Restriction	None
Usage	

Type	PolygonType
Definition	A planar **surface** defined by 1 **exterior boundary** and 0 or more **interior boundaries***. A Polygon is a special surface that is defined by a single surface patch (see D.3.6). The boundary of this patch is coplanar and the polygon uses planar interpolation in its interior*. The elements **exterior** and **interior*** describe the surface boundary of the polygon. A boundary of a surface consists of a number of rings. In the normal 2D case, one of these rings is distinguished as being the exterior boundary. In a general manifold this is not always possible, in which case all boundaries shall be listed as interior boundaries and the exterior will be empty. A boundary of a surface consists of a number of rings. The "interior" rings separate the surface/surface patch from the area enclosed by the rings*.
Comments	1. In reference to Notes (*) from above: For the purpose of initial release of this specification, the polygon 'interior' element has been removed to simplify the schema to promote adoption and implementation across EDXL message standards.
Schema	`edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic2d.xsd`
Schema Component	`<complexType name="PolygonType"> <complexContent> <extension base="gml:AbstractSurfaceType"> <sequence> <element ref="gml:exterior" minOccurs="0"/> </sequence> </extension> </complexContent> </complexType>`
Used In	Polygon or semantically equivalent component

Element	Envelope
BaseType	`gml:EnvelopeType`
Usage	
Definition	Envelope defines an extent using a pair of positions defining opposite corners in arbitrary dimensions. The first direct position is the "lower corner" (a coordinate position con-sisting of all the minimal ordinates for each dimension for all points within the envelope), the second one the "upper corner" (a coordinate position consisting of all the maximal ordinates for each dimension for all points within the envelope). *The use of the properties "coordinates" and "pos" has been deprecated.* The explicitly named properties "lowerCorner" and "upperCorner" shall be used instead.
Comments	1.
Schema	`edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd`

Element	Envelope
Schema Component	<element name="Envelope" type="gml:EnvelopeType" substitutionGroup="gml:AbstractObject"> <annotation> <documentation> Envelope defines an extent using a pair of positions defining opposite corners in arbitrary dimensions. The first direct position is the "lower corner" (a coordinate position consisting of all the minimal ordinates for each dimension for all points within the envelope), the second one the "upper corner" (a coordinate position consisting of all the maximal ordinates for each dimension for all points within the envelope). The use of the properties "coordinates" and "pos" has been deprecated. The explicitly named properties "lowerCorner" and "upperCorner" shall be used instead. </documentation> </annotation> </element>
Used In	gml:boundedBy or other application-specific component
Examples	<gml:Envelope> <gml:lowerCorner>42.943 -71.032</gml:lowerCorner> <gml:upperCorner>43.039 -69.856</gml:upperCorner> </gml:Envelope>

Type	EnvelopeType
BaseType	Substitution group: gml:AbstractObject
Restriction	None
Usage	
Definition	Envelope defines an extent using a pair of positions defining opposite corners in arbitrary dimensions. The first direct position is the "lower corner" (a coordinate position con-sisting of all the minimal ordinates for each dimension for all points within the envelope), the second one the "upper corner" (a coordinate position consisting of all the maximal ordinates for each dimension for all points within the envelope).
Comments	1.
Schema	edxl-gsf-base.xsd; refers to: http://schemas.opengis.net/gml/3.2.1/geometryBasic0d1d.xsd
Schema Component	<complexType name="EnvelopeType"> <sequence> <element name="lowerCorner" type="gml:DirectPositionType"/> <element name="upperCorner" type="gml:DirectPositionType"/> </sequence> <attributeGroup ref="gml:SRSReferenceGroup"/> </complexType>
Used In	Envelope or semantically equivalent component

4 Conformance

The last numbered section in the specification must be the Conformance section. Conformance Statements/Clauses go here.

TBD

Appendix A Acknowledgements

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

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Appendix B Non-Normative Text

Appendix C Revision History

Revision	Date	Editor	Changes Made
WD01	03/23/2011	Werner Joerg	Initial Setup
WD02	03/27/2011	Lew Leinenweber	Initial draft
WD03	03/29/2011	Lew Leinenweber	Revision and update and overall edits
WD04	05/18/2011	Lew Leinenweber	Revision and update of simple feature elements and types; added and revised schema examples
WD05	06/06/2011	Lew Leinenweber	Revised initial draft ready for upload and review by EM-TC members
WD06	06/08/2011	Lew Leinenweber	Revised Section 3.1.1 to remove LineStringSegment and LineStringSegmentType; updated document title of ref [OGC-OASIS-SF]; corrected LineString <choice> to include gml:posList
WD07	06/28/2011	Lew Leinenweber	Corrected schema reference fragments for <choice> structure and elements; added gml schema file reference for each edxl-gsf element and type; revised Point example xml instance
WD08	07/19/2011	Lew Leinenweber	Corrected LineStringType to add attributes 'minoccurs' and 'maxoccurs' to element <pos> Deleted Circle and CircleType which are not required and to be consistent with edxl-gsf-base.xsd schema Deleted gml:pointProperty element from CircleByCenterPointType to be consistent with edxl-gsf-base.xsd schema Added EDXLLocation and EDXLLocationType element tables to be consistent with edxl-gsf.xsd schema
WD09	7/28/2011	Lew Leinenweber	Revised Section 3.1.1 to include new element and type EDXLGeoLocation and EDXLGeoLocationType replacing EDXLLocation and EDXLLocationType to be consistent with updates to edxl-gsf.xsd schema. Removed 'gml:interior' element from PolygonType definition
WD10	9/13/2011	Lew Leinenweber	Updated WD number to be consistent with version of updated schemas