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Geospatial-eXtensible Markup Language

Draft

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1. Graphics based G-XML Implementation Specification

This chapter describes the implementation specification of Graphics based G-XML (Ver.1.0).

Graphics based G-XML uses SVG, which is a general-purpose XML-based vector description language, as the description language for geometry of features. SVG is a format to describe only shapes. In order to use SVG as a map, some information unique to maps should be added. In this chapter, such additional information is referred to as Graphics based G-XML unless specifically noted.

The specification of SVG is beyond the scope of this chapter, and will not be covered. Please see the specification document by W3C (<http://www.w3.org/TR/SVG/>).

In principle, “.ggx” is used as the extension of Graphics based G-XML file.

1.1. DTD for Graphics based G-XML

(1) DTD

```
<!ELEMENT dataset (unit,translation) >
```

```
<!ELEMENT unit (#PCDATA) >
```

```
<!ELEMENT translation (a,d,e,f) >
```

```
<!ELEMENT a (#PCDATA) >
```

```
<!ELEMENT d (#PCDATA) >
```

```
<!ELEMENT e (#PCDATA) >
```

```
<!ELEMENT f (#PCDATA) >
```

(2) XML tree structure for Graphics based G-XML

Names of elements (attributes)

```
dataset
  unit
  translation
    a
    d
    e
    f
```

1.2. Commentary on Graphics based G-XML

Individual elements of Graphics based G-XML are described below.

1.2.1. dataset

(1) Description

Representing the root element of the unique part to Graphics based G-XML.

(2) DTD

```
<!ELEMENT dataset (unit,translation) >
```

(3) Parent element(s)

SVG

(4) Child element(s)

Name	Meaning	Notes
unit	the unit of the coordinates.	Required
translation	Translation parameters from the SVG coordinate system to the map coordinate system.	Required

(5) Attribute(s)

None

1.2.2. unit

(1) Description

Representing the unit of the coordinate values.

(2) DTD

```
<!ELEMENT unit (#PCDATA) >
```

(3) Parent element(s)

dataset

(4) Child element(s)

None

Keywords representing the units are stored in the text node.

A keyword is one of the following values.

“Dot” : Dot values (pixels) of the screen coordinate system

“BL” : Latitude and longitude

“Meter” : Meter

“Kilometer” : Kilometer

(5) Attribute(s)

None

1.2.3. translation

(1) Description

Translation parameters for transforming from the original SVG coordinates to the display coordinates.

(2) DTD

```
<!ELEMENT translation (a,d,e,f) >
```

(3) Parent element(s)

dataset

(4) Child element(s)

Name	Meaning	Notes
a	parameter a	Required Takes real values.
d	parameter d	Same as above
e	parameter e	Same as above
f	parameter f	Same as above

See * for the meaning of each parameter.

(5) Attribute(s) (All of them Optional)

None

* Details of translation parameters

The Affine transformation is used for transformation from the original SVG coordinates to the display coordinates.

$$x = a * x' + e$$

$$y = d * y' + f$$

(x , y) : transformed coordinate values (display coordinates)

(x' , y') : original SVG coordinate values (Values to be transformed)

a, d, e and f are individual parameters.

1.2.4. a

(1) Description

Translation parameter a.

(2) DTD

```
<!ELEMENT a (#PCDATA) >
```

(3) Parent element(s)

translation

(4) Child element(s)

None

The real value of parameter a is entered in the text node. Required.

See 1.2.3. translation for the meaning of parameter a.

(5) Attribute(s) (All of them Optional)

None

1.2.5. d

(1) Description

Translation parameter d.

(2) Description

```
<!ELEMENT d (#PCDATA) >
```

(3) Parent element(s)

translation

(4) Child element(s)

None

The real value of parameter d is entered in the text node. Required.

See 1.2.3. translation for the meaning of parameter d.

(5) Attribute(s) (All of them Optional)

None

1.2.6. e

(1) Description

Translation parameter e.

(2) DTD

```
<!ELEMENT e (#PCDATA) >
```

(3) Parent element(s)

translation

(4) Child element(s)

None

The real value of parameter e is entered in the text node. Required.

See 1.2.3. translation for the meaning of parameter e.

(5) Attribute(s) (All of them Optional)

None

1.2.7. f

(1) Description

Translation parameter f.

(2) DTD

```
<!ELEMENT f (#PCDATA) >
```

(3) Parent element(s)

translation

(4) Child element(s)

None

The real value of parameter f is entered in the text node. Required.

See 1.2.3. translation for the meaning of parameter f.

(5) Attribute(s) (All of them Optional)

None

1.3. Example of Graphics based G-XML

Graphics based G-XML is based on SVG and embeds dataset elements in SVG using XML Namespace.

Below is an example of Graphics based G-XML including SVG.

```
<?xml version="1.0" standalone="no"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG August 1999//EN"
  "http://www.w3.org/Graphics/SVG/SVG-19990812.dtd">
<svg width="500px" height="300px" xmlns="svg.dtd"
      xmlns:gx="G-GXML10A.DTD">
  <gx:dataset>
    <gx:unit>Dot</gx:unit>
    <gx:translation>
      <gx:a>1</gx:a>
      <gx:d>-1</gx:d>
      <gx:e>0</gx:e>
      <gx:f>-200</gx:f>
    </gx:translation>
  </gx:dataset>

  <path d="M 100 100 C 125 125 175 125 200 100" />
  <text x="50" y="100">Text on path</text>
  <rect x="100" y="150" width="20" height="60"/>
  <circle cx="200" cy="200" r="100"/>
  <line x1="200" x2="250" y1="300" y2="350">
  <polyline points="20,20 50,100 200,80 70,300"/>
  <polygon points="20,20 50,100 200,80 70,300"/>
</svg>
```

In this example, elements prefixed with "gx:" are Graphics based G-XML elements. A prefix depends on the namespace declaration (xmlns:gx in svg element).

All elements without a prefix are SVG elements.

Table of Contents

1. GRAPHICS BASED G-XML IMPLEMENTATION SPECIFICATION	1
1.1. DTD FOR GRAPHICS BASED G-XML	2
1.2. COMMENTARY ON GRAPHICS BASED G-XML	4
1.2.1. <i>dataset</i>	5
1.2.2. <i>unit</i>	6
1.2.3. <i>translation</i>	7
1.2.4. <i>a</i>	8
1.2.5. <i>d</i>	9
1.2.6. <i>e</i>	10
1.2.7. <i>f</i>	11
1.3. EXAMPLE OF GRAPHICS BASED G-XML	12