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0000938	X3D	19775-1 (Abstract)	public	2016-03-21 02:43	2016-03-22 17:05

Reporter	walroy
Assigned To	brutzman

Priority	normal	**Severity**	minor	**Reproducibility**	N/A
Status	confirmed	**Resolution**	open		

Summary 0000938: 25.2.3 Specifying a spatial reference frame - UTM values don't include optional "N"

Description There are a large number of Geospatial examples where the geosystem field does not conform to the current specifications. For example:

Examples Archive, Basic, Geospatial, Squaw LOD 029 (see http://www.web3d.org /x3d/content/examples/Basic/Geospatial/SquawLOD029.x3d)

Note the first two nodes under the Scene element are:

    <GeoLOD center='4344125.917539 743027.217291 2133.000000'
geoSystem='"UTM" "Z10" "N"' range='0.0'>
     <GeoOrigin DEF='ORIGIN' geoCoords='4342525.5 740604 0' geoSystem='"UTM"
"Z10" "N"' rotateYUp='true'/>

Both contain a "N" as the third string.

Now, review the abstract specification 19775-1, 25.2.3 Specifying a spatial reference frame (see http://www.web3d.org/documents/specifications/19775-1/V3.3/Part01 /components/geodata.html#Specifyingaspatialreference).

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In particular, consider the second bullet point headed "UTM". Note that an optional "S" is permitted, otherwise an "N" is assumed. An "N" is not permitted.

It is instructive, now, to turn to the specification ISO/IEC 18026:2009 Information technology – Spatial Reference Model (SRM). In particular, clause 8.7.7 Universal transverse Mercator and review Table 8.61 – SRF set membership Universal transverse Mercator (UTM). The table is divided into two halves. The first has the SSM label:

"ZONE_"+<code>+"_NORTHERN_HEMISPHERE", where the "+" symbol shall denote concatenation of character strings

with an SSM code of 1... 60. The second half has the SSM label:

"ZONE_"+<(code-60)>+"_SOUTHERN_HEMISPHERE", where the "+" symbol shall denote concatenation of character strings

with an SSM code of 61...120.

Thus, the SRM specification requires the hemisphere to be explicitly detailed.

I therefore propose that the X3D specification should permit the 'N' to be included. However, in order to retain backwards compatibility, it should be optional, with northern hemisphere assumed as the default if not explicitly stated.

This change would align the geosystem field with the SRM. The examples could remain unchanged. Validation tools, such as the Schematron and the JSON schema, would need to be updated.

Additional Information	Submitted by Roy Walmsley to X3D and Geospatial lists 21st March 2016 http://web3d.org/mailman/private/x3d_web3d.org/2016-March/004430.html http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000167.html
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~0001499
walroy (developer)
2016-03-21 10:55
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'N' should definitely be allowed.

In fact, I had interpreted the spec. such that all strings are allowed but some have a special meaning. If there is a string that does not have an associated function it is ignored. If that is a possible interpretation then no changes may be needed.

There is another issue which is not addressed. How should conflicts be resolved ? For example, there may be a 'Z10' and a 'Z11' string. An easy rule would be to pick the first one occuring. It may not be necessary to deal with nonsensical geoSystems, however.

Since this has been discussed previously, should we go back and look up if there was a resolution ?

Submitted by Andreas Plesch 21st March 2016
http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000168.html

~0001500
walroy (developer)
2016-03-22 04:21
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Thanks for your response. I know it has been talked about previously, but I could not find a Mantis issue about it.

I used the e-mail I wrote to create an issue, namely Mantis issue 938 (http://www.web3d.org/member-only/mantis/view.php?id=938). I have now added your comment below as a note.

I would have to disagree somewhat with your comments on the argument strings. The following comments, all from section 25.2.3 are relevant.

The sixth sentence in the first paragraph reads "Optional arguments may appear in any order". This implies, although it is not explicitly stated, that required arguments must be in the correct order.

The first argument is either "GD", UTM", or "GC". Clause 25.2.2 does also permit the synonyms "GDC" and "GCC".

If the first argument is "GD" then optional arguments of one ellipsoid (from Table 24.3) and "WGS84" are permitted. Note the wording is "An optional argument may be used to specify the ellipsoid using one of the

ellipsoid codes …". So only one argument. Similarly "An optional WGS84 …". Again only one.

If the first argument is "UTM" then the text says "One further required argument must be supplied for UTM in order to specify the zone number …". Note, only one. And, since it is required, it must be the second argument. Then there is the optional "S", an optional ellipsoid, and an optional "WGS84". Each option can only appear once, although the optional arguments can be in any order.

Finally, if the first argument is "GC" no additional arguments are permitted.

The specification is quite clear that, for example, multiple zone numbers are not permitted. Such an instance in an X3D scene would make the scene non-conforming. Clause 6 Conformance of 19775-1 does not detail how X3D browsers should respond when presented with non-conforming scenes, leaving it up to the individual implementation.

Submitted by Roy Walmsley 21st March 2016
http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000169.html

~0001501
walroy (developer)
2016-03-22 04:22
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thanks for in-depth analysis. I agree with all points, in particular the point about having at most one value for an optional argument. So I do not
think there is an issue with potential conflicts between arguments.

However, I am not sure if the word "supported" as used in this spec. section means "permitted" as you seem to imply. To me, it means that values
other than listed are also permitted though currently not utilized.

http://www.web3d.org/documents/specifications/19775-1/V3.3/Part01/components/geodata.html#Specifyingaspatialreference

Submitted by Andreas Plesch 21st March 2016
http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000170.html

~0001502
walroy (developer)
2016-03-22 04:22
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True, the specification reads "The following values are supported". It doesn't expressly talk of 'permitted'. However, neither does it say that any other values are permitted. This is often indicated in the node signature for the field having enumeration values listed such as ["ALL" "NONE" …] with an ellipsis used to indicate other values are permitted. In the geosystem case, however, there is only the comment "[see 25.2.3]". So the specification would likely benefit from clarification on this point.

Submitted by Roy Walmsley 21st March 2016
http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000171.html

~0001503
walroy (developer)

good observation that there is no ellipsis in the field signature for geoSystem. Since the number of arguments can vary from one to four,

2016-03-22 04:23	there

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probably should be an ellipsis there.

I would be fine with a schema that allows any string in the geoSystem field
which is how currently the language can be interpreted. This would make obviously all examples conforming.

But I can see that it may be beneficial to be more strict in validating the field. In this case, "supported" could be replaced by "permitted" although it sounds somewhat draconian.

Finally, the sentence

An optional argument of "S" may be supplied in order to specify that the coordinates are in the southern hemisphere (otherwise, northern hemisphere
will be assumed).

may be replaced by

An optional argument of "S" or "N" may be supplied in order to specify that
the coordinates are in the southern or northern hemisphere, respectively (otherwise, northern hemisphere will be assumed).

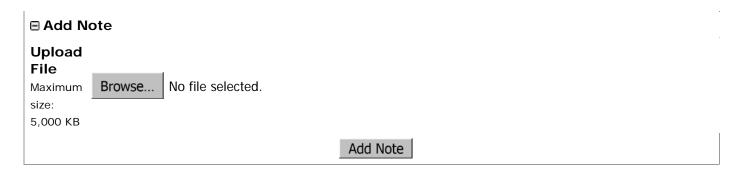"respectively" is not ideal, so this could be rephrased.

UTM zones generally have the trailing N or S, so this follows typical usage. I would actually prefer an argument like 10N to fully define a zone in one string (without the Z but with required N/S) but this would not be backward compatible.

Submitted by Andreas Plesch 21st March 2016
http://web3d.org/mailman/private/geospatial_web3d.org/2016-March/000172.html

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Date Modified	Username	Field	Change
2016-03-21 02:43	walroy	New Issue	
2016-03-21 10:55	walroy	Note Added: 0001499	
2016-03-22 04:21	walroy	Note Added: 0001500	
2016-03-22 04:22	walroy	Note Added: 0001501	
2016-03-22 04:22	walroy	Note Added: 0001502	
2016-03-22 04:23	walroy	Note Added: 0001503	
2016-03-22 17:04	brutzman	Assigned To	=> brutzman
2016-03-22 17:04	brutzman	Status	new => acknowledged
2016-03-22 17:05	brutzman	Status	acknowledged => confirmed

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