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2017-05-10 08:29 PDT

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ID	Project	Category	View Status	Date Submitted	Last Update
0001091	X3D	19776-1 (XML)	public	2016-12-08 02:46	2016-12-30 13:10
Reporter	walroy				
Assigned To	brutzman				
Priority	normal	Severity	minor	Reproducibility	N/A
Status	acknowledged	Resolution	open		

Summary 0001091: 5.15 SFString and MFString - Confusion between XML and X3D syntax for SFString
Description Comment on 19776-1: XML Encoding - V3.3
 5.15 SFString and MFString
<http://www.web3d.org/documents/specifications/19776-1/V3.3/Part01/EncodingOfFields.html#SFString>

 Confusion between xml and x3d syntax for SFString

Problem statement: 5.15 states which kind of quotes should be used for the xml attribute value for SFString and MFString. But that's specified in the xml standard: both single quotes and double quotes are valid. When an XML-encoded X3D file is parsed by a generic XML parser, there is no way to know which kind of quote was used, and that shouldn't be necessary. For an SFString, str="foo" or str='foo' should both be valid; and for an MFString, str=""foo" "bar"" or str=""foo" "bar"".

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Suggested solution: replace

SFString specifies a single string encoded as a sequence of UTF-8 octets enclosed in double quotes (e.g., "string").

The MFString specifies zero or more SFStrings enclosed in single quotes (e.g., "string1" "string2")

with

SFString specifies a single string encoded as a sequence of UTF-8 octets without additional quotes (as an XML attribute value, it must be enclosed in single or double quotes, e.g. "string" or 'string'). The MFString specifies zero or more SFStrings, each of them enclosed in double quotes, separated by at least one space (as an XML attribute value, it must be enclosed in single or double quotes, and conflicting single and double quotes in the content must be written as entities; e.g., "string1" "string2"; for more complicated cases with single quotes in the first string and double quotes in the second string, "\"string1\" \"string2\" or \"string1\" \"string2\"")

Additional Information

Submitted on Wednesday, 2016, December 7 - 4:03pm

by (Yves Piguet)

IP: 178.196.7.81

See: <http://www.web3d.org/node/1694/submission/1108>

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~0001675

walroy (developer)

2016-12-08 02:53

This "feature" (or would that be 'feature') has been a point of discussion and argument since the XML encoding was first introduced. To keep consistent with VRML (Classic VRML), the elements of MFString are quoted ("). This doesn't prevent a user from quoting (with ") the entire attribute value. That would force using the entity format for individual elements:

```
mfString=""element-1" "element-2"
"element-3" ... " ... />
```

This format gets messy, especially if there are a lot of special characters that need to be converted to entities.

An entirely new way that is more XML-/HTML-centric would be to use child elements

```
<Node ...>
  <mfString>element-1</mfString>
  <mfString>element-2</mfString>
  <mfString>element-3</mfString>
  :
  :
</Node>
```

The above format is nice because it is also CDATA-friendly

Submitted by Leonard Daly on 7th December 2016

http://web3d.org/mailman/private/x3d_web3d.org/2016-December/005460.html

~0001676

walroy (developer)

2016-12-08 02:57

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My comment was just about the wording of 19776-1 V3.3: the XML encoding should just be valid XML, and you cannot add requirements on that part because (i) it's useless; and (ii) XML libraries usually don't let you specify or read them.

On the other hand, I agree that storing SFString and MFString field values in XML nodes would be convenient; but that would be an extension for a future revision of the X3D standard. I'd rather have an XML tag name like `<value ...>` or `<fieldvalue ...>` to avoid confusion with X3D nodes; and a more general mechanism which allows any field type, nice for large arrays. There is also the issue of white space normalization in XML attributes, which in SFString and MFString forces you to use X3D escape sequences for spaces, tabs and line breaks; mixing them with xml entities is ugly. The exception of allowing cdata only for the url field of Script nodes isn't very satisfactory. Actually I can't even find where this exception is clearly stated in 19776-1, except en passant in 6.2.179 without explanation (this might call for another spec comment...)

Originally submitted by Yves Piguet on 7th December 2016

Forwarded by Roy Walmsley to the X3D list 8th December 2016

http://web3d.org/mailman/private/x3d_web3d.org/2016-December/005460.html

~0001678

walroy (developer)

2016-12-09 02:43

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Hopefully the quotes are all matching your original intent.

Please note that an XML parser will accept `str=""foo" "bar"` satisfactorily, but attribute

a. `str=""foo" "bar"`

gets terminated at the first `str=""` and the remainder will throw a parse error as malformed content.

Candidate replacements that are legal XML:

b. `str=""foo" "bar"`

and

c. `str=""foo" "bar"`

Option b is preferred if using X3D Canonical Form, perhaps for digital signature or encryption. Readable too.

Note that in general, any "user agent" program handling the XML may choose to represent as either form, and the author has no particular choice at that point.

So we have to be careful not to get overzealous and try to mandate some XML behaviors over which we have no control.

Further backslash and escaping contortions may occur if the strings themselves include \" escaped quotes as content.

Please check out the explanations in `_X3D for Web Authors_` and especially the slides/examples. X3D-Edit has a bunch of user-assist work going on behind the scenes to help authors in this regard. The X3D Validator (X3D Schema, X3D Schematron) attempts to apply regexes to detected malformed MFString expressions; improvements may be possible.

<http://x3dgraphics.com/slidesets/X3dForWebAuthors/Chapter02-GeometryPrimitives.pdf> (slides 82-89)

<http://x3dgraphics.com/examples/X3dForWebAuthors/Chapter02-GeometryPrimitives/TextSpecialCharactersIndex.html>

Reassuring: we have not yet found an MFString that cannot be represented. Test cases welcome.

Also reassuring is that we are just talking about the XML encoding - DOM handling and other encoding/language representations for X3D are simpler.

Hesitation is suggested before thinking that an easier solution is possible, since escaping designs are always subtle/complex and all existing content and tools will still need to be supported.

Submitted by Don Brutzman on 8th December 2016

http://web3d.org/mailman/private/x3d_web3d.org/2016-December/005469.html

~0001679

walroy (developer)

2016-12-09 02:46

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p.s. found further relevant references

Metacharacter

<https://en.wikipedia.org/wiki/Metacharacter>

> In many programming languages, strings are delimited using quotes. In some cases, escape characters (and other methods) are used to avoid delimiter collision. Example : "He said : \"Hello\"".

Delimiter collision

https://en.wikipedia.org/wiki/Delimiter_collision

Submitted by Don Brutzman on 8th December 2016

http://web3d.org/mailman/private/x3d_web3d.org/2016-December/005471.html

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2016-12-08 02:51	walroy	Relationship added	related to 0001071
2016-12-08 02:51	walroy	Relationship added	related to 0000705
2016-12-08 02:51	walroy	Relationship added	related to 0000488
2016-12-08 02:53	walroy	Note Added: 0001675	
2016-12-08 02:57	walroy	Note Added: 0001676	
2016-12-09 02:43	walroy	Note Added: 0001678	
2016-12-09 02:46	walroy	Note Added: 0001679	
2016-12-30 13:10	brutzman	Assigned To	=> brutzman
2016-12-30 13:10	brutzman	Status	new => acknowledged

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