

Saxon - Bug #4578

NullPointerException when array:fold-left|right \$zero argument is an empty sequence

2020-06-07 22:21 - Vladimir Nesterovsky

Status:	Closed	Start date:	2020-06-07
Priority:	Normal	Due date:	
Assignee:	Michael Kay	% Done:	100%
Category:	XPath conformance	Estimated time:	0:00 hour
Sprint/Milestone:		Spent time:	0:00 hour
Legacy ID:		Fix Committed on	10, 9.9
Applies to branch:	10, 9.9	Branch:	
		Fixed in Maintenance	10.2, 9.9.1.8
		Release:	

Description

Following xslt gives an error:

```
<?xml version="1.0" encoding="utf-8"?>
<xsl:stylesheet version="3.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:array="http://www.w3.org/2005/xpath-functions/array"
  exclude-result-prefixes="xs array">
```

```
<xsl:template match="/">
  <xsl:sequence select="
    array:fold-left
      (
        [8, 9],
        (),
        function($first as item(), $second as item())
        {
          min(($first, $second))
        }
      )"/>
</xsl:template>
```

```
</xsl:stylesheet>
```

```
java.lang.NullPointerException
  at net.sf.saxon.functions.hof.CoercedFunction.call (CoercedFunction.java:151)
  at net.sf.saxon.functions.SystemFunction.dynamicCall (SystemFunction.java:454)
  at net.sf.saxon.ma.arrays.ArrayFunctionSet$ArrayFoldLeft.call (ArrayFunctionSet.java:269)
  at net.sf.saxon.expr.FunctionCall.iterate (FunctionCall.java:543)
  at net.sf.saxon.expr.Expression.process (Expression.java:949)
  at net.sf.saxon.expr.SystemFunctionCall.process (SystemFunctionCall.java:476)
  at net.sf.saxon.expr.instruct.TemplateRule.applyLeavingTail (TemplateRule.java:376)
  at net.sf.saxon.trans.Mode.applyTemplates (Mode.java:555)
  at net.sf.saxon.trans.XsltController.applyTemplates (XsltController.java:659)
  at net.sf.saxon.s9api.AbstractXsltTransformer.applyTemplatesToSource (AbstractXsltTransform
er.java:360)
  at net.sf.saxon.s9api.Xslt30Transformer.applyTemplates (Xslt30Transformer.java:285)
  at net.sf.saxon.Transform.processFile (Transform.java:1313)
  at net.sf.saxon.Transform.doTransform (Transform.java:853)
  at net.sf.saxon.Transform.main (Transform.java:82)
java.lang.RuntimeException: Internal error evaluating template rule  at line 7 in module file:/C:/
projects/git/xslt-graph/tests/saxon-10.1-internal-error.xslt
  at net.sf.saxon.expr.instruct.TemplateRule.applyLeavingTail (TemplateRule.java:393)
  at net.sf.saxon.trans.Mode.applyTemplates (Mode.java:555)
  at net.sf.saxon.trans.XsltController.applyTemplates (XsltController.java:659)
  at net.sf.saxon.s9api.AbstractXsltTransformer.applyTemplatesToSource (AbstractXsltTransform
er.java:360)
  at net.sf.saxon.s9api.Xslt30Transformer.applyTemplates (Xslt30Transformer.java:285)
```

```
at net.sf.saxon.Transform.processFile (Transform.java:1313)
at net.sf.saxon.Transform.doTransform (Transform.java:853)
at net.sf.saxon.Transform.main (Transform.java:82)
Caused by: java.lang.NullPointerException
at net.sf.saxon.functions.hof.CoercedFunction.call (CoercedFunction.java:151)
at net.sf.saxon.functions.SystemFunction.dynamicCall (SystemFunction.java:454)
at net.sf.saxon.ma.arrays.ArrayFunctionSet$ArrayFoldLeft.call (ArrayFunctionSet.java:269)
at net.sf.saxon.expr.FunctionCall.iterate (FunctionCall.java:543)
at net.sf.saxon.expr.Expression.process (Expression.java:949)
at net.sf.saxon.expr.SystemFunctionCall.process (SystemFunctionCall.java:476)
at net.sf.saxon.expr.instruct.TemplateRule.applyLeavingTail (TemplateRule.java:376)
... 7 more
```

History

#1 - 2020-06-07 22:57 - Vladimir Nesterovsky

This produces NPE but with different message:

```
<xsl:sequence select="
  array:fold-left
  (
    [8, 9],
    (),
    function($first, $second) { min(($first, $second)) }
  )"/>
```

Exception in thread "main" java.lang.AssertionError:
Internal error: no value for variable \$first at line 17 of file:/C:/projects/git/xslt-graph/tests/saxon-10.1-internal-error.xslt

#2 - 2020-06-08 01:09 - Michael Kay

- Subject changed from *saxon-10.1-internal-error.xslt* to *NullPointerException when array:fold-left/right \$zero argument is an empty sequence*
- Category set to *XPath conformance*
- Assignee set to *Michael Kay*
- Priority changed from *Low* to *Normal*
- Applies to branch *9.9 added*

Saxon throws a `NullPointerException` if the second argument (`$zero`) of `array:fold-left` or `array:fold-right` is an empty sequence.

Further, if the value of the `$zero` argument is a sequence containing two or more items, all but the first items are ignored.

Added test cases to the relevant test sets in QT3.

#3 - 2020-06-08 01:14 - Michael Kay

- Fix Committed on Branch 10, 9.9 added

#4 - 2020-06-08 01:14 - Michael Kay

- Status changed from *New* to *Resolved*

#5 - 2020-06-08 15:42 - Vladimir Nesterovsky

If I correctly understand, the problem was to some extent related to eager evaluation of `$zero` parameter in `array:fold-left()`, and to some expectations about its cardinality.

This recalls me the case with `fold-left()` function (not `array:fold-left()`) where we experienced x4 performance differences depending on structure of `$zero` parameter.

See <https://saxonica.plan.io/boards/3/topics/7888>

#6 - 2020-06-08 15:54 - Michael Kay

The bug was embarrassingly stupid. The implementation provides a standard `call()` interface

```
public Sequence<?> call(XPathContext context, Sequence[] arguments) throws XPathException {
```

and for the `$zero` argument it was using the standard coding pattern for singleton arguments:

```
Sequence zero = (Sequence) (arguments[1].head());
```

instead of

```
Sequence zero = arguments[1];
```

The real culprit was that all the QT3 test cases for this function used a singleton item as the value of \$zero.

Thanks for reminder about message 7888, but I'm afraid it hasn't been possible to find time to investigate this, given that there's no suggestion of a product bug, only a minor optimization opportunity.

#7 - 2020-08-26 10:23 - O'Neil Delpratt

- *% Done changed from 0 to 100*

- *Fixed in Maintenance Release 10.2 added*

Bug fix applied in the Saxon 10.2 maintenance release.

#8 - 2020-10-22 18:17 - O'Neil Delpratt

- *Status changed from Resolved to Closed*

- *Fixed in Maintenance Release 9.9.1.8 added*

Bug fix applied on the Saxon 9.9.1.8 maintenance release.