IBM Software Group

WebSphere DataPower SOA Appliances and XSLT (Part 1 of 2) - Tools

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ON DEMAND BUSINESS™

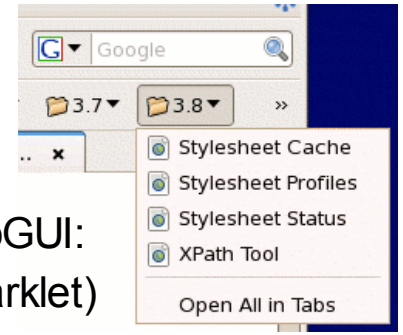
Agenda

DataPower tools

- **built-in**
- others

Appendix

Bookmarking DataPower screens for easy access



- Multibox bookmarklets – they avoid navigation through left navbar in WebGUI:
  - Stylesheet Cache (3.7.x bookmarklet / 3.8.0 bookmark / 3.8.0 bookmarklet)
    - javascript:window.mainFrame.genericStatusRequest('StylesheetCachingSummary',%20'genericStatus')
    - https://yourbox:webguiport/status/StylesheetCachingSummary
    - javascript:void(location=window.location.href.replace(/(^[^:]*:\/\/[^/]*).*$/g,'$1')+'/status/StylesheetCachingSummary')
  - Xpath Tool (3.7.x bookmark / 3.8.0 bookmark / 3.8.0 bookmarklet)
    - .../TaskTemplates/SelectXPath.xml?...
    - https://boxip:webguiport/service/SelectXPath?popup=true&newObjPopup=true&newObjPopupInput=input_XPath&step=get-started&popuplocation=
    - javascript:void(window.open(window.location.href.replace(/(^[^:]*:\/\/[^/]*).*$/g,'$1')+'/service/SelectXPath?popup=true&newObjPopup=true&newObjPopupInput=input_XPath&step=get-started&popuplocation=').focus())
  - Works for FF, IE, Chrome and Safari browsers

Source: Bookmarklets and WebGUI posting on developerWorks DataPow er Forum

Stylesheet profiling (1/2)

- Configure profiling of a stylesheet by
  - a compile option policy (for its XML Manager)
  - and a matching “Profile Rule” there.
- Sending requests against the service containing the stylesheet gives profiling information.
- This may be looked up in WebGUI under “Status→XML Processing→Stylesheet Profiles”
- Flushing the XML Manager resets the profile information.
- <dp:profile> allows to define profiling regions

manager	Output Mode	URL	Name	Location	Count	Type	Time(ms)
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	match="/"	local:///xyz.xsl:17	100	template	1401
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="calc-offset"	local:///xyz.xsl:26	4300	template	7938
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="build-token-array"	local:///xyz.xsl:54	2500	template	13260
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="process-delimiter"	local:///xyz.xsl:78	2500	template	13069
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="find-end-delimiter-index-from-root"	local:///xyz.xsl:143	400	template	5537
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="hex-to-text"	local:///xyz.xsl:184	23900	template	57835
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	local:///hexWrapper.ffd:4	built-in	100	template	662
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV40]:	local:///xyz.xsl:5	100	template	187
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	input-message	local:///xyz.xsl:5	100	global var	172
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV41]:	local:///xyz.xsl:6	100	template	2626
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	offsets	local:///xyz.xsl:6	100	global var	24671
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV42]:	local:///xyz.xsl:16	100	template	79
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	delimiter-count	local:///xyz.xsl:16	100	global var	59
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Init Template	built-in	100	template	687

Source: Appendix D. Compile Options Policy configuration/Profiling overview (`CommandReference`)

Stylesheet profiling

```
<xsl:template name="hex-to-text">
  <xsl:param name="str"/>
  <xsl:variable name="raw"
    select="dp:binary-decode(dp:radix-convert($str,16,64))"/>
  <xsl:value-of select="$raw"/>
</xsl:template>
```

- Sample of improvement (replace pure XSLT implementation of “hex-to-text” by an implementation making use of extension functions -- template hex-to-text gets inlined)

manager	Output Mode	URL	Name	Location	Count	Type	Time(ms)
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	match="/"	local:///xyz.xsl:17	100	template	1401
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="calc-offset"	local:///xyz.xsl:26	4300	template	7938
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="build-token-array"	local:///xyz.xsl:54	2500	template	13260
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="process-delimiter"	local:///xyz.xsl:78	2500	template	13069
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="find-end-delimiter-index-from-root"	local:///xyz.xsl:143	400	template	5537
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	name="hex-to-text"	local:///xyz.xsl:184	23900	template	57835
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	local:///hexWrapper.ffd:4	built-in	100	template	662
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV40]:	local:///xyz.xsl:5	100	template	187
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	input-message	local:///xyz.xsl:5	100	global var	172
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV41]:	local:///xyz.xsl:6	100	template	2626
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	offsets	local:///xyz.xsl:6	100	global var	24671
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Lazy Template for [GV42]:	local:///xyz.xsl:16	100	template	79
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	delimiter-count	local:///xyz.xsl:16	100	global var	59
profile	Stream	xslt-p-s-f-M://local:///xyz.xsl	Init Template	built-in	100	template	687

manager	Output Mode	URL	Name	Location	Count	Type	Time(ms)
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	match="/"	local:///abc.xsl:17	100	template	1342
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	name="calc-offset"	local:///abc.xsl:26	4300	template	7847
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	name="build-token-array"	local:///abc.xsl:54	2500	template	12557
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	name="process-delimiter"	local:///abc.xsl:78	2500	template	20638
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	name="find-end-delimiter-index-from-root"	local:///abc.xsl:143	400	template	5038
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	local:///hexWrapper.ffd:4	built-in	100	template	643
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	Lazy Template for [GV40]:	local:///abc.xsl:5	100	template	185
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	input-message	local:///abc.xsl:5	100	global var	169
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	Lazy Template for [GV41]:	local:///abc.xsl:6	100	template	2428
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	offsets	local:///abc.xsl:6	100	global var	23687
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	Lazy Template for [GV42]:	local:///abc.xsl:16	100	template	73
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	delimiter-count	local:///abc.xsl:16	100	global var	52
profile	Stream	xslt-p-s-f-M://local:///abc.xsl	Init Template	built-in	100	template	598

Stylesheet tracing

- Configure tracing of a stylesheet by
  - a compile option policy (for its XML Manager)
  - and a matching “Debug Rule” there.
- Sending a request against the service containing the stylesheet returns a trace HTML page.
- If needing a (less informative) trace facility not affecting MultiStep processing you may want to have a look at trace.xslt by Oliver Becker.

I found "trace.xslt" on Oliver Becker's homepage:
http://www2.informatik.hu-berlin.de/~obecker/XSLT/#trace

I tried it -- and it seems to work!
Basically "trace.xslt" transforms a stylesheet to another one which then produces the trace output by <xsl:message> statements.

So how get this working in DataPower?
As an example I created a XML FW with just a match and xform action.
For transformation I used attached complicated identity xform id.xsl (it is more complicate than needed in order to demonstrate the tracing feature).

Now enabling tracing is done by:
1) add fetch action after the match fetching "local:///id.xsl", output PIPE
2) add xform action after fetch, input PIPE, output context "trace" and "local:///trace.xslt" xform
3) apply all changes for the policy and the XML FW
4) Under "Objects-->XML Processing-->Processing Action" open the non-added xform action
5) Replace "local:///id.xsl" by "trace" in "Transform" field and apply.

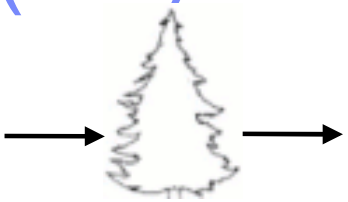
That's all, after setting log-level to "information" sending

Source: CommandReference / trace.xslt by Oliver Becker

Debug Output Trace

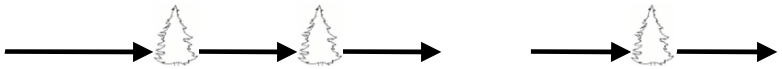
file	line	position()	info
CommonPrefix.xsl	58	1	Template entered: match="/"
CommonPrefix.xsl	59	1	<out
CommonPrefix.xsl	6	1	Template entered: name="CommonPrefix"
CommonPrefix.xsl	7	1	Variable 'a' defined as a string with value 'abcdefghijklmnopqrstuvwxyz'
CommonPrefix.xsl	8	1	Variable 'b' defined as a string with value 'abcdefghijklmnopqrstuvwxy0'
CommonPrefix.xsl	10	1	Variable 'A' defined as a number with value 26
CommonPrefix.xsl	11	1	Variable 'B' defined as a number with value 26
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'abcdefghijklmnopqrstuvwxyz'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value 'abcdefghijklmnopqrstuvwxy0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 13.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value 'abcdefghijklm'
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value 'abcdefghijklm'
CommonPrefix.xsl	41	1	>abcdefghijklm
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'nopqrstuvwxyz'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value 'nopqrstuvwxy0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 6.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value 'nopqrs'
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value 'nopqrs'
CommonPrefix.xsl	41	1	nopqrs
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'tuvwxyz'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value 'tuvwxy0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 3.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value 'tuv'
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value 'tuv'
CommonPrefix.xsl	41	1	tuv
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'wxyz'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value 'wxy0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 2.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value 'wx'
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value 'wx'
CommonPrefix.xsl	41	1	wx
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'yz'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value 'y0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 1.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value 'y'
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value 'y'
CommonPrefix.xsl	41	1	y
CommonPrefix.xsl	29	1	Template entered: name="CommonPrefixRec"
CommonPrefix.xsl	30	1	Variable 'a' defined as a string with value 'z'
CommonPrefix.xsl	31	1	Variable 'b' defined as a string with value '0'
CommonPrefix.xsl	33	1	Variable 'mid' defined as a number with value 0.000000
CommonPrefix.xsl	34	1	Variable 'a1' defined as a string with value ''
CommonPrefix.xsl	35	1	Variable 'b1' defined as a string with value ''
CommonPrefix.xsl	41	1	</out>

DataPower XML data processing (1/4)



- Document Object Model (DOM)
  - Reads all of the XML data and forms the corresponding tree in memory.
  - After building the tree, the application program processes the data.
  - Processing consists of one or more traversals of the data in arbitrary order.
  - As it performs these traversals, the application program generates the output.

- Simple API for XML model (SAX)
  - Combines the reading of the data with the processing.
  - Reading the nodes the application processes them and then deletes its storage.
  - In other words, the tree is not built. Instead, the data is processed on-the-fly.
  - All schema validation in the DataPower appliance uses the SAX model.



- Streaming model
  - Hybrid technique, the application starts processing in SAX model manner.
  - If needed the application program builds trees for that part of the data as the DOM.
  - After processing of this tree completes it is immediately removed.
  - Flexibility of the DOM model with some of the storage advantages of the SAX model.

Source: OptimizingThroughStreaming-v1.pdf

Streaming (2/4)

- This stylesheet is streamable.
- The commenting out was necessary (double use of “.”).
- You can send documents containing millions of records through the box without noticeable memory increase.

```
<?xml version="1.0" encoding="UTF-8"?>
<document>id=0000
firstname=Al
lastname=Aranow
street=1 Any St.
city=Anytown
state=AL
zip=22000

id=0001
...
...
id=999999
firstname=James
lastname=Jones
street=100 Any St.
city=Anytown
state=WY
zip=22199

</document>
```

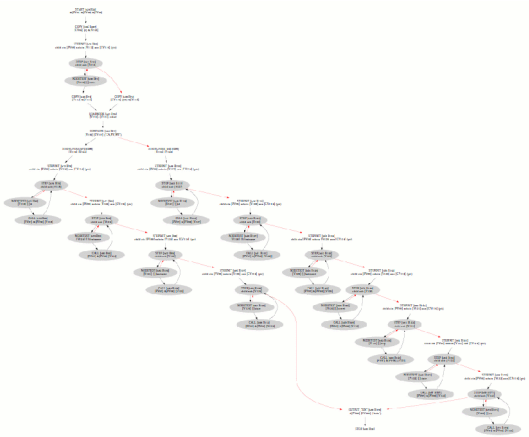
```
<document>0000
Al
Aranow
1 Any St.
Anytown
AL
22000

0001
...
...
999999
James
Jones
100 Any St.
Anytown
WY
22199

</document>
```

```
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
>
  <xsl:template match="table">
    <document>
      <xsl:apply-templates select="row"/>
    </document>
  </xsl:template>

  <xsl:template match="row">
    <xsl:apply-templates select="id"/>
    <xsl:apply-templates select="firstname"/>
    <xsl:apply-templates select="lastname"/>
    <xsl:apply-templates select="street"/>
    <xsl:apply-templates select="city"/>
    <xsl:apply-templates select="state"/>
    <xsl:apply-templates select="zip"/>
    <xsl:text>&#x0A;</xsl:text>
  </xsl:template>

  <xsl:template match="id|firstname|lastname|street|city|state|zip">
  <!--
    <xsl:value-of select="name(.)"/>
    <xsl:text>=</xsl:text>
  -->
    <xsl:value-of select="."/>
    <xsl:text>&#x0A;</xsl:text>
  </xsl:template>

</xsl:stylesheet>
```

Source: Find stylesheet and script for generating large input data in appendix

Partial Streaming (3/4)

- This template is not streamable SAX like.
- Reason is the <xsl:choose> statement.
- But the stylesheet is partially streamable.
- A single record is processed DOM like.
- After processing the memory is given back immediately.
- Again you can send documents containing millions of records through the box without noticeable memory increase



```
...
  <xsl:templ
    <xsl:choose>
      <xsl:when test="contains('CA,NY,WY',state)">
        <xsl:apply-templates select="id"/>
        <xsl:apply-templates select="firstname"/>
        <xsl:apply-templates select="lastname"/>
        <xsl:apply-templates select="state"/>
      </xsl:when>
      <xsl:otherwise>
        <xsl:apply-templates select="id"/>
        <xsl:apply-templates select="firstname"/>
        <xsl:apply-templates select="lastname"/>
        <xsl:apply-templates select="street"/>
        <xsl:apply-templates select="city"/>
        <xsl:apply-templates select="state"/>
        <xsl:apply-templates select="zip"/>
      </xsl:otherwise>
    </xsl:choose>
    <xsl:text>&#x0A;</xsl:text>
  </xsl:template>
...
```

Source: Find stylesheet and script for generating large input data in appendix

Determine why a stylesheet is not streamable (4/4)

- A stylesheet will only be processed streaming if
  - a compile option policy is configured for its XML Manager,
  - a matching “Streaming Rule” or “Attempt Streaming Rule” is configured there
  - and the stylesheet itself is streamable.
- In order to determine whether a stylesheet is streamable
  - use matching “Streaming Rule” (to enforce streaming mode)
  - send any traffic against a service containing an action using the stylesheet
  - in case the stylesheet is not streamable you will get a generic error in the log.
- For stylesheets not being streamable find the reason by
  - switch to “Status→XML Processing→Stylesheet Status” in WebGUI
  - inspect stylesheet's entry
  - lookup column “Compiler Log” for detailed errors

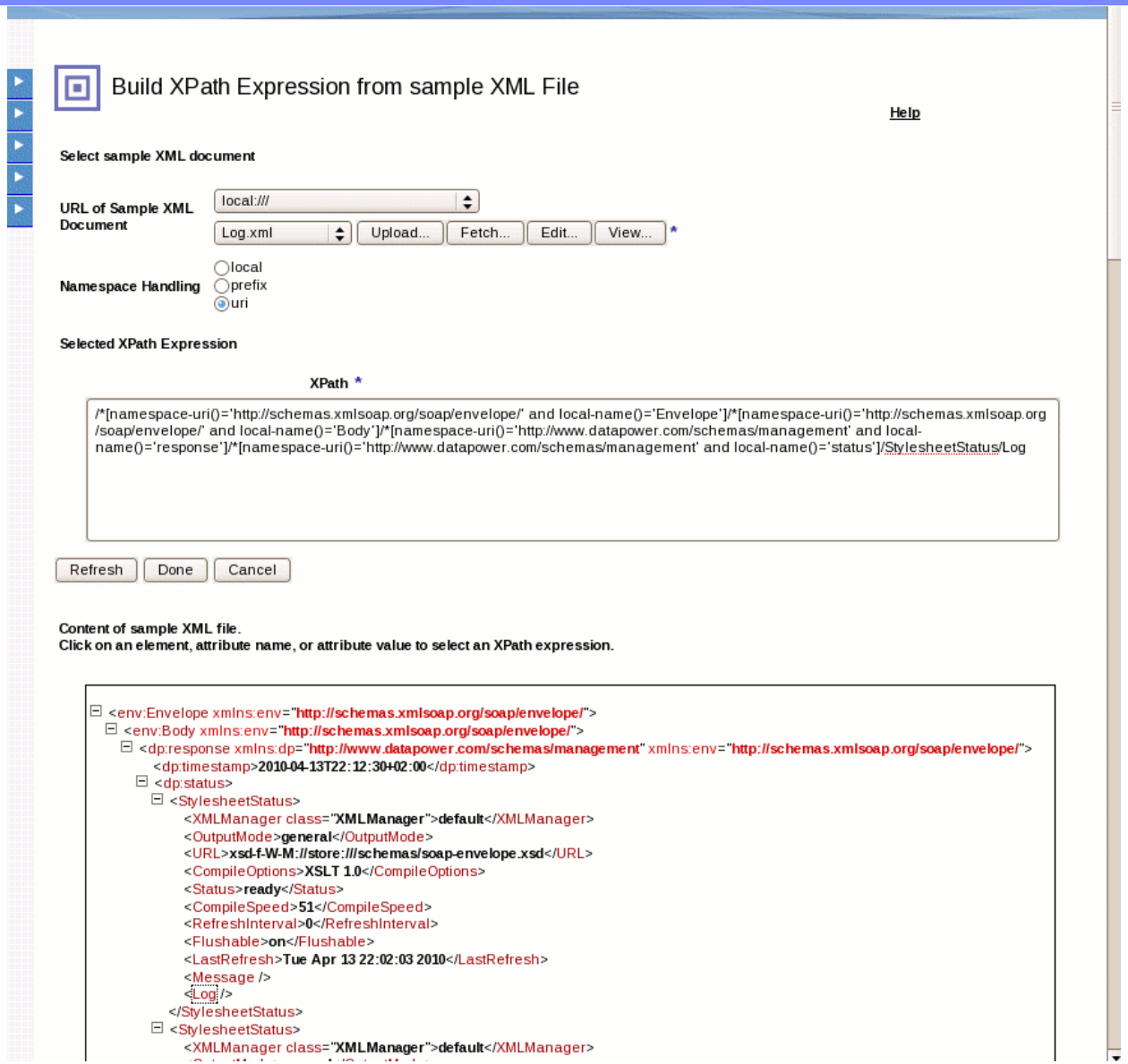
force	Stream	xslt-s-m-f-M-X://local:///number.xsl	XSLT 1.0, failed to stream input	Ready	2	0	on	Mon Apr 12 17:50:54 2010		Error at local:///number.xsl:5: xsl:number not streamable.

XPath Tool

- In WebGUI's left navbar click on "Objects->XML Processing->XPath Routing Map"
- Click on "Add" and select the "Rules" tab
- Click "Add" again, a popup opens
- Click "XPath Tool" in the popup, "Xpath Tool" popup opens.

- Or use “bookmark”

- Upload XML file
- Click somewhere (eg. Log)
- Inspect generated Xpath and take it as a start



Agenda

DataPower tools

- built-in
- **others**

Appendix

Using xpath tool to gain information on XML and XSL files

```
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:dyn="http://exslt.org/dynamic"
  extension-element-prefixes="dyn"
>
  <xsl:output method="xml" omit-xml-declaration="yes"/>
  <xsl:template match="/">
    <xsl:copy-of select="dyn:evaluate(string((//comment())[last()]))"/>
  </xsl:template>

</xsl:stylesheet>
```

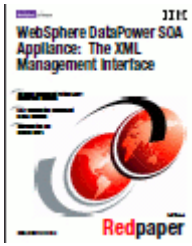
- $ xpath "string(//*[name()='xsl:copy-of']/@select)" xpath.xsl
  dyn:evaluate(string((//comment())[last()]))
  $
  → get insight in stylesheet

- $ xpath "count(//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-
  …
  each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each']//*[name()='xsl:for-each'])" HugeXslFor-each.xsl
  4
  $
  → uncovering (structural) performance issues in stylesheets

- xpath "/*/*/*[name()='dp:response']/*[name()='dp:status']/StylesheetStatus/Log[text()]" …
  → returns all warnings/errors retrieved by get-status SOMA call for compiled stylesheets

Source: xpath tool posting on developerWorks DataPow er Forum

Scripting DataPower



- DataPower Scripting is preferably done over the XML Management Interface
- This is a really good RedPaper on this topic:
  WebSphere DataPower SOA Appliance: The XML Management Interface
  Rolf Wittich
  http://www.redbooks.ibm.com/abstracts/redp4446.html
- Internal CLI scripting is possible, too:
  - store a CLI script eg. as “local:///script.cfg”
  - open a CLI session to the box
  - do “exec local:///script.cfg”
- External CLI scripting can be done eg. with “netcat” command (nc, Linux®/Cygwin)
  - have Telnet service enabled (on intranet interface)
  - store sequence of entries of a CLI session into eg. cli.txt
  - execute “nc yourbox telnetport < cli.txt”
- Executing CLI commands from within a stylesheet is possible (posting link below)
  - While DataPower currently has no raw TCP support on the front side it HAS support for raw TCP on the back side, the protocol "tcp:" (→ Telnet service)

```
$ cat cli.txt
stammw
geheim
default
show mem
show cpu
exit
$
```

Source: Executing CLI commands from within a stylesheet posting on developerWorks DataPower Forum

Processing UTF-8 URL-encoded URIs with WebSphere DataPower

Output of below stylesheet in Multi-step Probe:

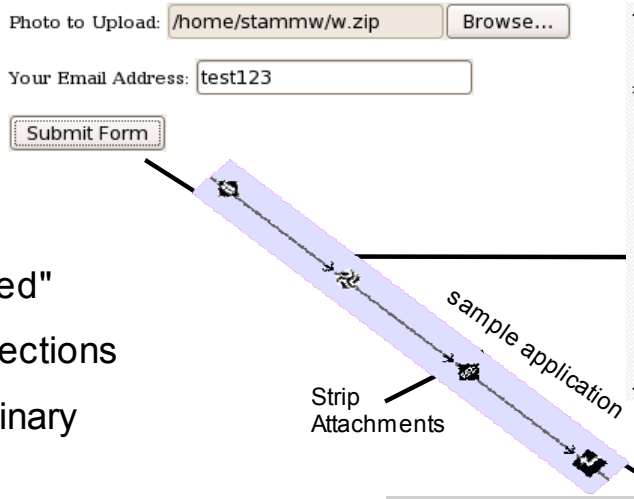
```
<request xmlns:env="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:dp="http://www.datapower.com/schemas/management">
<url>/utf8uri?danish=%C3%86-%C3%98-%C3%85&french=%C5%92-%C3%A6&
german=%C3%84-%C3%96-%C3%9C-%C3%9F&spanish=%CA%A7-%EA%9D
%86-%C3%91</url>
<base-url>/utf8uri</base-url>
<args src="url">
<arg name="danish">Æ-Ø-Å</arg>
<arg name="french">Œ-æ</arg>
<arg name="german">Ä-Ö-Ü-ß</arg>
<arg name="spanish">ʧ-ʩ-Ñ</arg></args></request>
```

- DataPower action "convert-http"
  - creates XML document for HTTP form data
  - converts non-XML query parameters to XML
  - assumption is ISO-8859-1 encoding
- Workaround for UTF-8, see technote referenced at bottom
- Main aspects of workaround
  - Accessing the URL
    - … select="dp:variable('var://service/URI')" /> …
  - Tokenizing the query
    - <xsl:for-each select="str:tokenize(substring-after($url,'?'),'&')">
  - Decoding the UTF-8 URL-encoded data
    - … select="str:decode-uri(substring-after(.,'='))" …
- DataPower provides lots of Extension functions/elements, you may want to have a look into the Extension Functions Catalog …

Source: Processing UTF-8 URL-encoded URIs w ith WebSphere DataPow er technote

Enhancing “near” SOAP With Attachment data

- SWA
  (Soap With Attachments)
  - MIME boundaries
  - content type "multipart/related"
  - Content-ID for each/most sections
  - arbitrary content including binary
  - first section SOAP
- HTTP form data (HTTP POST)
  - content type "multipart/form-data"
  - Content-Disposition for sections
- swaform tool
  - Non-XML request type policy
  - replaces "Content-Type" multipart/form-data by multipart/related
  - replaces 'Content-Disposition ... name="xyz" ...' by 'Content-Id: <xyz>'
  - prepends root section with "dummy" SOAP message




```
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:dp="http://www.datapower.com/extensions"
  extension-element-prefixes="dp"
>
  <xsl:output method="xml"/>

  <xsl:template match="/">
    <attachments>
      <photo><dp:url-open target="cid:photo?Encode=hexbin" /></photo>

      <xsl:variable name="email">
        <dp:url-open target="cid:email_address?Encode=base64" />
      </xsl:variable>
      <xsl:variable name="raw" select="dp:binary-decode($email)" />
      <email_address><xsl:value-of select="$raw"/></email_address>

      <Submit><dp:url-open target="cid:Submit?Encode=base64" /></Submit>
    </attachments>
  </xsl:template>
</xsl:stylesheet>
```

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
- <attachments>
  - <photo>
    - <hexbin>
        504b0304140000000080009824d3b651495e1ad010000a9030000080015007772617 02e747874555409C
      </hexbin>
    </photo>
    <email_address>test123</email_address>
  - <Submit>
      <base64>U3VibWl0IEZvcm0=</base64>
    </Submit>
  </attachments>
```

Source: swaform -- using HTTP forms as generator for "Soap With Attachments" posting on developerWorks DataPower Forum

Processing embedded stylesheets

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<?xml-stylesheet type="text/xsl" href="#style1"?>
<!DOCTYPE catalog [
<!ATTLIST xsl:stylesheet id ID #REQUIRED>
]>
<catalog>
<xsl:stylesheet id="style1" version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">

<xsl:template match="/">
  <html>
```

- Not many customers are using "Transform (Using Processing Instruction)" at all.
- DataPower does not support processing of "embedded stylesheets" out of the box.

- Use an "Extract Using XPath" action to extract the stylesheet into a context "ctx".
- The XPATH to use is
- //*[attribute::*[local-name()='id']=substring-before(substring-after(/processing-instruction()[local-name()='xml-stylesheet'],'href="#'),'")]
- Be careful with the single and double quotes.
- It extracts the stylesheet by the id referenced by href in xml-stylesheet processing instruction into context "ctx".
- Next use a xform action reading from INPUT with processing control file "ctx".
- It is not possible to create this in WebGUI directly.
- After having selected any xform action (eg. store://identity.xsl) you have to
  - edit the action in CLI and execute "transform ctx" to make the xform action take the stylesheet from context "ctx"
  - or via WebGUI using Objects menu, select Objects→XML Processing→Processing Action, the Transform is a text field in this page and you input "ctx" there.

Source: 2.7 Embedding Stylesheets (XSLT 1.0 spec) / cdcatalog.xml

Agenda

DataPower tools

- built-in
- others

Appendix

Appendix (for copy&paste)

dbgen.pl

```
#!/usr/bin/perl

$size = shift;

if ($size eq "")
{
    die "usage:  dbgen.pl [size]\n";
}

@firstnames = ("Al", "Bob", "Charles", "David",
"Egon", "Farbood",
               "George", "Hank", "Inki", "James");
@lastnames = ("Aranow", "Barker", "Corsetti",
"Dershowitz", "Engleman",
              "Franklin", "Grice", "Haverford",
"Ilvedson", "Jones");
@states = ("AL", "AK", "AZ", "AR", "CA", "CO", "CT",
"DE", "FL", "GA",
           "HI", "ID", "IL", "IN", "IA", "KS", "KY",
"LA", "ME", "MD",
           "MA", "MI", "MN", "MS", "MO", "MT", "NE",
"NV", "NH", "NJ",
           "NM", "NY", "NC", "ND", "OH", "OK", "OR",
"PA", "RI", "SC",
           "SD", "TN", "TX", "UT", "VT", "VA", "WA",
"WV", "WI", "WY");

print "<?xml version=\"1.0\"?>\n";
print "\n";
print "<table>\n";

for ($i=0; $i<$size; $i++)
{
    $first = $firstnames [$i % 10];
    $last = $lastnames [($i / 10) % 10];
    $state = $states [($i / 100) % 50];
    $zip = 22000 + $i / 5000;

    printf "  <row>\n";
    printf "    <id>%04d</id>\n", $i;
    printf "    <firstname>$first</firstname>\n", $i;
    printf "    <lastname>$last</lastname>\n", $i;
    printf "    <street>%d Any St.</street>\n", ($i %
100) + 1;
    printf "    <city>Anytown</city>\n";
    printf "    <state>$state</state>\n";
    printf "    <zip>%d</zip>\n", $zip;
    printf "  </row>\n";
}

print "</table>\n";
```

dbsql.xsl

```
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/
Transform"
>

<xsl:template match="table">
  <document>
    <xsl:apply-templates select="row"/>
  </document>
</xsl:template>

<xsl:template match="row">
  <xsl:apply-templates select="id"/>
  <xsl:apply-templates select="firstname"/>
  <xsl:apply-templates select="lastname"/>
  <xsl:apply-templates select="street"/>
  <xsl:apply-templates select="city"/>
  <xsl:apply-templates select="state"/>
  <xsl:apply-templates select="zip"/>
  <xsl:text>&#x0A;</xsl:text>
</xsl:template>

<xsl:template match="id|firstname|lastname|
street|city|state|zip">
  <xsl:value-of select="."/>
  <xsl:text>&#x0A;</xsl:text>
</xsl:template>

</xsl:stylesheet>
```

dbsql1.pl

```
<xsl:stylesheet version="1.0"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
>
  <xsl:template match="table">
    <document>
      <xsl:apply-templates select="row"/>
    </document>
  </xsl:template>

  <xsl:template match="row">
    <xsl:choose>
      <xsl:when test="contains('CA,NY,WY',state)">
        <xsl:apply-templates select="id"/>
        <xsl:apply-templates select="firstname"/>
        <xsl:apply-templates select="lastname"/>
        <xsl:apply-templates select="state"/>
      </xsl:when>
      <xsl:otherwise>
        <xsl:apply-templates select="id"/>
        <xsl:apply-templates select="firstname"/>
        <xsl:apply-templates select="lastname"/>
        <xsl:apply-templates select="street"/>
        <xsl:apply-templates select="city"/>
        <xsl:apply-templates select="state"/>
        <xsl:apply-templates select="zip"/>
      </xsl:otherwise>
    </xsl:choose>
    <xsl:text>&#x0A;</xsl:text>
  </xsl:template>

  <xsl:template match="id|firstname|lastname|street|
city|state|zip">
    <xsl:value-of select="."/>
    <xsl:text>&#x0A;</xsl:text>
  </xsl:template>

</xsl:stylesheet>
```

Summary

- Built-in DataPower tools (Stylesheet profiling and tracing, XPath tool)
- DataPower XML Data Processing (streaming, partial streaming)
- Other DataPower tools (xpath tool, scripting, processing UTF-8 URL-encoded URIs, Enhancing “near” SOAP With Attachment data, processing embedded stylesheets)

- Next webcast (2/2) will be on “Tips and Tricks”

Additional WebSphere Product Resources

- Learn about upcoming WebSphere Support Technical Exchange webcasts, and access previously recorded presentations at:
  http://www.ibm.com/software/websphere/support/supp_tech.html
- Discover the latest trends in WebSphere Technology and implementation, participate in technically-focused briefings, webcasts and podcasts at:
  http://www.ibm.com/developerworks/websphere/community/
- Join the Global WebSphere User Group Community:
  http://www.websphere.org
- Access key product show-me demos and tutorials by visiting IBM® Education Assistant:
  http://www.ibm.com/software/info/education/assistant
- View a webcast replay with step-by-step instructions for using the Service Request (SR) tool for submitting problems electronically:
  http://www.ibm.com/software/websphere/support/d2w.html
- Sign up to receive weekly technical My Notifications emails:
  http://www.ibm.com/software/support/einfo.html

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