WML Transformations

Version 6-November-2001

Wireless Application Protocol
WAP-244-WMLTR-20011106-a

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Document History	
WAP-244-WMLTR-20011106-a	Current
WAP-244_100-WMLTR-20011106-p	Approved SIN

Contents

1. Scope

Specifies transformation rules for transforming WML 1.3 documents into WML 2.0 documents.

2. References

2.1. Normative References

[CREQ]	"Specification of WAP Conformance Requirements". WAP Forum™. WAP-221-CREQ-20010425-a. URL:http//www.wapforum.org/
[CXML]	"Canonical XML version 1.0". W3C Recommendation 15 March 2001. URL: http://www.w3.org/TR/2001/REC-xml-c14n-20010315
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997. URL:http://www.ietf.org/rfc/rfc2119.txt
[WML2]	"WML 2.0", WAP-238-WML. URL:http://www.wapforum.org/
[WML1]	"WML 1.3", WAP-191-WML-20000219-a. URL:http://www.wapforum.org/
[WTA]	"WTA", WAP-169-WTA. URL:http://www.wapforum.org/

2.2. Informative References

[WAPARCH]	"WAP Architecture". WAP Forum™. WAP-210-WAPArch-20001130-p. URL:http//www.wapforum.org/
[XSLT]	"XSL Transformations (XSLT) Version 1.1", W3C Working Draft 12 December 2000. URL:http://www.w3.org/TR/xslt11
[XMLNS]	"Namespaces in XML", W3C Recommendation 14 January 1999. URL: http://www.w3.org/TR/1999/REC-xml-names
[XHTMLBasic]	"XHTML™ Basic", W3C Recommendation 19 December 2000. URL:http://www.w3.org/TR/2000/REC-xhtml-basic-20001219
[XHTMLMod]	"Modularization of XHTML™", W3C Recommendation 10 April 2001. URL:http://www.w3.org/TR/xhtml-modularization

3. Terminology and Conventions

3.1. Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119].

Definitions are written as

> **Definition:** A definition is a term or expression that is used a lot.

Notes are written as

> **Note**: An informational message to the reader.

3.2. Abbreviations

WAP	Wireless Application Protocol
WML	Wireless Markup Language
WTA	Wireless Telephony Applications
XHTML	Extensible Hypertext Markup Language
XML	Extensible Markup Language
XSLT	Extensible Stylesheet Language Transformations

4. Introduction (Informative)

This document assumes the reader is familar with XSLT [XSLT], WML1 [WML1], and WML2 [WML2].

Although WML 2.0 [WML2] supports all features of WML 1.3 [WML1], since WML 2.0 is based on XHTML and WML 1.3 is a language of its own, the WML 2.0 user agent cannot read WML 1.3 documents. The element names and how they are combined is different. In WML 2.0, for example, the root element is `html` in WML 1.3 it is `wml`, and WML 2.0 does not have the WML 1.3 `template` element.

It is possible, however, to transform a valid WML 1.3 document into a valid WML 2.0 document. Older versions of WML 1.3 that are valid WML 1.3 documents can also be transformed. It is also possible to transform WTA-WML 1.2 [WTA] documents. The transformation can be made transparent to the user. Users can access WAP 1 services from a WML 2.0 user agent without detecting any difference compared to real WAP 2 services.

This specification does not mandate, or even recommend, where or when the transformation should take place. It may be in one of the following places:

- In a proxy server that enables WML 2.0 user agents to access WML 1.3 documents.
- In a server that automatically transforms WML 1.3 documents into WML 2.0 document when requested by a WML 2.0 user agent.

The WAP 2.0 client may, as an additional alternative, support WML 1.3 by transforming such documents into WML 2.0 before the WML 2.0 user agent processes the document.

The transformation rules are specified in section 6 as an XSLT [XSLT] transformation sheet. The use of XSLT in order to specify the transformation rules as formal and complete as possible, does not suggest that a XSLT transformation sheet is the only possible implementation, not even that it is an efficient one. Depending on where the transformation takes place, it may be implemented in many different ways.

4.1. Overview of Changes Between WML Version 1.3 and 2.0

Here is an overview of the changes that have been made to WML since version 1.3 and a few words about the transformation.

- Instead of being a document type of its own, WML 2.0 is an extension of the following XHTML modules [XHTMLMod]: every XHTML module supported by XHTML Basic [XHTMLBasic], the Block level presentation module, the Inline Stylesheets module, and the Stylesheets module. This means that some elements now have more attributes, and there are many new elements as well.
- Each element declares an XML Namespace [XMLNS]. The default namespace is XHTML. The WML namespace is bound to the 'wml' prefix.
- The root element is `html` instead of `wml`.
- The `head` element is mandatory. If there is none, the transformation inserts one.
- The XHTML `title` element in the document header is required. In the transformation the title of the first card of the WML 1 document as the document title.
- The `template` element has been removed. Instead template-level elements may be located directly after the head element. The transformation moves the elements to their new location.
- Shadowing of `do` elements is not supported. The transformation distributes the template-level `do` elements into the cards according to the WML 1.3 shadowing algorithm.
- The "ordered" attribute on the `card` element has been removed. Ignored by the transformation.

- Nesting of `optgroup` is illegal. Only the first level is transformed. Deeper levels are collapsed into a flat list of `optgroup` elements.
- The new "label" attribute on the `optgroup` is mandatory. Transformation inserts an empty label.
- The "optional" attribute on the `do` element has been removed. Ignored by the transformation.
- The `do` element can be used in more places than in WML 1.3. For example, inside a `td` element.

WML 2.0 extends XHTML elements with WML attributes and extends the XHTML document model with WML elements. In some cases, WML 2.0 also extends the XHTML document model with XHTML elements:

- Inline tables. In WML 2.0 the `table` element can be inside the `p` element. This is illegal in XHTML. In order to transform from WML 1.3, however, it is allowed in WML 2.0.
- The form control elements `input` and `select` can be inside the `pre` element. This is illegal in XHTML. In order to transform from WML 1.3, however, it is allowed in WML 2.0.

5. The WML Transformation Processor (Normative)

This section defines the WML transformation processor, a *black box*, called *E* in the rest of this section.

Definition: Transformation processor *X* implements exactly the XSLT transformation sheet defined in section 6 of this document. (It may be any conforming XSLT 1.1. [XSLT] processor that takes the transformation sheets from section 6 as input.)

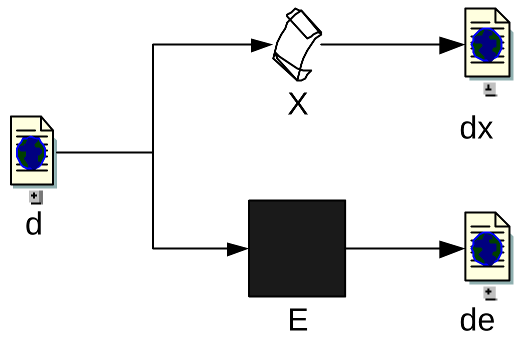
Definition: Document *d* is any valid WML 1.3 [WML1] or WTA-WML 1.2 [WTA] document.

Documents older than WML 1.3 may also be valid WML 1.3 documents.

Definition: Document *dx* is the result of transforming d using X. (X(d) -> dx).

Definition: Document *de* is the result of transforming d using E. (E(d) -> de).

This is illustrated in the following figure:



Transformation processor *E* conforms to this specification if the documents *dx* and *de* are identical after *XML canonicalization* [CXML] has been applied.

An effect of this conformance clause is that the two documents, *dx* and *de*, may look lexically different, depending on the implementation of *E* and *X*.

6. Transformation Rules (Normative)

This section is an XSLT 1.1 [XSLT] transformation sheet that defines all transformation rules of this specification.

The transformation sheet is organised in the following way. There is one template for each WML 1.3 element in the source document. The template creates the corresponding WML 2.0 element in the result document, plus any additional attributes. It goes on to apply appropriate templates on all element types that may be children of the current WML 1.3 element.

Because in order transform the WML 1.3 `do` element the WML 1.3 shadowing algorithm must be applied, the transformation of the `do` element is the most complex. It takes two templates.

The resulting document is a valid WML 2.0 document with the XHTML and WML namespaces and, since the document may be part of a larger WAP 1 service, the 'use-xml-fragment' [WML2] attribute set to *false*. It also gets the WML 2.0 document type declaration before the root element.

The transformation sheet uses an auxiliary Java class (*org.wapforum.wml.WMLExpression*) in order to extract WML variables from text.

6.1. XSLT Transformation Sheet

This transformation sheet is available at

http://www.wapfourm.org/xslt/wap-244-wmltr.xsl

```
<!--
@Wireless Application Protocol Forum, Ltd. 2001.

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Wireless Application Protocol Forum Ltd.

Web site (http://www.wapforum.org/what/copyright.htm).
-->
<!--
This XSLT transformation sheet transforms valid WML 1.3 and WTA-WML 1.2
documents into valid WML 2.0 documents.

Support for XSLT 1.1 is required.
-->

<xsl:transform
    version="1.1"
    xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
    xmlns:wml="http://www.wapforum.org/2001/wml"
    xmlns:wmlexpr="http://www.wapforum/2001/wml-expression"
    exclude-result-prefixes="wmlexpr"
    xmlns="http://www.w3.org/1999/xhtml"
>

<!-- NOTE: This requires support for XSLT 1.1. http://www.w3.org/TR/xslt11/-->
    <xsl:script
        implements-prefix="wmlexpr"
        language="java"
        src="java:org.wapforum.wml.WMLExpression"
    />

<xsl:template match="select">
    <select>
        <xsl:copy-of select="@id | @class | @xml:lang | @title | @name | @tabindex" />

        <xsl:if test="boolean(@multiple='true')">
            <xsl:attribute name="multiple">multiple</xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@iname)" >
            <xsl:attribute name="wml:iname">
            <xsl:value-of select="@iname" />
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@ivalue)" >
            <xsl:attribute name="wml:ivalue">
            <xsl:value-of select="@ivalue" />
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@value)" >
            <xsl:attribute name="wml:value">
            <xsl:value-of select="@value" />
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@name)" >
            <xsl:attribute name="wml:name">
            <xsl:value-of select="@name" />
            </xsl:attribute>
        </xsl:if>

        <xsl:apply-templates select="option|optgroup" />
    </select>
</xsl:template>

<xsl:template match="optgroup">
    <optgroup>
        <xsl:copy-of select="@id | @class | @title | @xml:lang" />
        <xsl:attribute name="label"> </xsl:attribute>
        <!--NOTE: Nested optgroup elements are ignored-->
        <xsl:apply-templates select=".//option" />
    </optgroup>
</xsl:template>

<xsl:template match="option" >
```

```
    <option>
        <xsl:copy-of select="@id | @class | @xml:lang | @title | @value" />

        <xsl:if test="boolean(@onpick)" >
            <xsl:attribute name="wml:onpick">
                <xsl:value-of select="@onpick" />
            </xsl:attribute>
        </xsl:if>

        <xsl:apply-templates select="text() | onevent" />
    </option>
</xsl:template>

<xsl:template match="input" >
    <input>
        <xsl:copy-of select="@id | @class | @xml:lang | @title | @type | @size | @maxlength |
@tabindex | @value | @accesskey" />

    <xsl:if test="boolean(@name)" >
        <xsl:attribute name="wml:name">
        <xsl:value-of select="@name" />
        </xsl:attribute>
    </xsl:if>

    <xsl:if test="boolean(@format)" >
        <xsl:attribute name="wml:format">
        <xsl:value-of select="@format" />
        </xsl:attribute>
    </xsl:if>

    <xsl:if test="boolean(@emptyok)" >
        <xsl:attribute name="wml:emptyok">
        <xsl:value-of select="@emptyok" />
        </xsl:attribute>
    </xsl:if>
    </input>
</xsl:template>

<xsl:template match="fieldset" >
    <fieldset>
        <xsl:copy-of select="@id | @class | @xml:lang | @title" />

        <xsl:apply-templates
select="do|input|select|fieldset|text()|em|strong|b|i|u|big|small|br|img|anchor|a|table" />

    </fieldset>
</xsl:template>

<xsl:template match="img">
```

```
    <img>
        <xsl:copy-of select="@id | @class | @xml:lang | @height | @width | @align | @hspace |
@vspace | @alt | @src" />

    <xsl:if test="boolean(@localsrc)" >
        <xsl:attribute name="wml:localsrc">
        <xsl:value-of select="@localsrc" />
        </xsl:attribute>
    </xsl:if>

    </img>
</xsl:template>

<xsl:template match="a">
    <a>
        <xsl:copy-of select="@*"/>
        <xsl:apply-templates select="text() | br | img" />
    </a>
</xsl:template>

<xsl:template match="anchor">
    <wml:anchor>
        <xsl:copy-of select="@id | @class | @xml:lang | @accesskey | @title" />
        <xsl:apply-templates select="text()| br | img | go | prev | refresh" />
    </wml:anchor>
</xsl:template>

<xsl:template match="table">
    <table>
        <xsl:copy-of select="@id | @class | @xml:lang | @title" />

        <xsl:if test="boolean(@columns)" >
            <xsl:attribute name="wml:columns">
                <xsl:value-of select="@columns" />
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@align)" >
            <xsl:attribute name="wml:align">
                <xsl:value-of select="@align" />
            </xsl:attribute>
        </xsl:if>

        <xsl:apply-templates select="tr" />
    </table>
</xsl:template>

<xsl:template match="tr">
    <tr>
```

```
        <xsl:copy-of select="@id | @class" />

        <xsl:apply-templates select="td" />

    </tr>
</xsl:template>

<xsl:template match="td" >
    <td>
        <xsl:copy-of select="@*" />

        <xsl:apply-templates select="text()|br|em|strong|b|i|u|big|small|img|anchor|a" />
    </td>
</xsl:template>

<xsl:template match="b">
    <b>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </b>
</xsl:template>
<xsl:template match="u">
    <u>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </u>
</xsl:template>
<xsl:template match="i">
    <i>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </i>
</xsl:template>
<xsl:template match="big">
    <big>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </big>
</xsl:template>
<xsl:template match="small">
    <small>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </small>
```

```
</xsl:template>

<xsl:template match="em">
    <em>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </em>
</xsl:template>

<xsl:template match="strong">
    <strong>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="text() | em | strong |b |i |u |big |small | br | img | anchor |a
|table" />
    </strong>
</xsl:template>

<xsl:template match="br">
    <br>
        <xsl:copy-of select="@*" />
    </br>
</xsl:template>

<xsl:template match="pre">
    <pre>
        <xsl:copy-of select="@id | @class"/>
        <xsl:apply-templates select="text() | a | anchor | do | u | br | i | b | em | strong | input |
select" />
    </pre>
</xsl:template>

<xsl:template match="p">
    <p>
        <xsl:copy-of select="@id | @class | @xml:lang " />

        <xsl:if test="boolean(@mode)" >
            <xsl:attribute name="wml:mode">
                <xsl:value-of select="@mode" />
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="boolean(@align)" >
            <xsl:attribute name="align">
            <xsl:value-of select="@align" />
            </xsl:attribute>
        </xsl:if>
        <xsl:apply-templates
select="do|input|select|fieldset|text()|em|strong|b|i|u|big|small|br|img|anc hor|a|table" />
    </p>
</xsl:template>

<xsl:template match="onevent" >
    <wml:onevent>
        <xsl:choose>
        <xsl:when test="starts-with(@type, 'on')">
            <xsl:attribute name="type"><xsl:value-of select="substring-after(@type, 'on')"
/></xsl:attribute>
        </xsl:when>
        <xsl:otherwise>
            <xsl:attribute name="type"><xsl:value-of select="@type" /></xsl:attribute>
        </xsl:otherwise>
        </xsl:choose>
        <xsl:copy-of select="@id | @class" />
        <xsl:apply-templates select="prev | noop | refresh | go" />
    </wml:onevent>
</xsl:template>

<xsl:template name="DO">
                <wml:do>
                    <xsl:choose>
                        <xsl:when test="@type='accept'">
                            <xsl:attribute name="type">positive</xsl:attribute>
                        </xsl:when>
                        <xsl:when test="@type='prev'">
                            <xsl:attribute name="type">back</xsl:attribute>
                        </xsl:when>
                        <xsl:when test="@type='help'">
                            <xsl:attribute name="type">help</xsl:attribute>
                        </xsl:when>
                        <xsl:when test="@type='options'">
                            <xsl:attribute name="type">options</xsl:attribute>
                        </xsl:when>
                        <xsl:when test="@type='reset' or @type='delete'">
                            <xsl:attribute name="type">negative</xsl:attribute>
                        </xsl:when>
                        <xsl:otherwise>
                            <xsl:attribute name="type"><xsl:value-of select="@type"/></xsl:attribute>
                        </xsl:otherwise>
                    </xsl:choose>
                    <xsl:copy-of select="@id | @class | @xml:lang" />
                    <xsl:if test="@label">
                        <xsl:attribute name="label"><xsl:value-of select="@label"/></xsl:attribute>
                    </xsl:if>
                    <xsl:apply-templates select="prev|noop|go|refresh" />
                </wml:do>
```

```
</xsl:template>

<xsl:template match="do" >

    <xsl:param name="shadow" select="' '"/>
    <xsl:choose>
            <xsl:when test="@name">
                <xsl:if test="not(contains(string($shadow), @name) )">
                    <xsl:call-template name="DO" />
                </xsl:if>
            </xsl:when>
            <xsl:otherwise>
                <xsl:if test="not(contains(string($shadow), @type) )">
                    <xsl:call-template name="DO" />
                </xsl:if>
            </xsl:otherwise>
    </xsl:choose>
</xsl:template>

<xsl:template match="timer">
    <wml:timer>
        <xsl:copy-of select="@*" />
    </wml:timer>
</xsl:template>

<xsl:template match="meta">
    <meta>
        <xsl:copy-of select="@http-equiv | @name | @content | @scheme" />

        <xsl:if test="boolean(@forua)" >
            <xsl:attribute name="wml:forua">
                <xsl:value-of select="@forua" />
            </xsl:attribute>
        </xsl:if>
    </meta>
</xsl:template>

<xsl:template match="access">
    <wml:access>
        <xsl:copy-of select="@*" />
    </wml:access>
</xsl:template>

<xsl:template match="wml | wta-wml">
    <html
        wml:use-xml-fragments="false">

        <xsl:call-template name="Template.events" />
        <!-- NOTE: Ignore id and class on html and head and template element -->

        <head>
            <!-- NOTE: Use title of first card as document Title -->
            <title>
                <xsl:value-of select="card[position()=1]/@title" />
            </title>
            <xsl:apply-templates select="head/access | head/meta" />
        </head>

        <xsl:apply-templates select="template/onevent | card" />

    </html>
</xsl:template>

<xsl:template match="card">

    <wml:card>
        <xsl:copy-of select="@id | @class | @xml:lang | @title | @onenterforward |
@onenterbackward | @ontimer | @newcontext"/>

        <xsl:apply-templates select="onevent | timer | p | pre | do" />

        <xsl:if test="not(p | pre)">
            <p/>
        </xsl:if>


        <!-- Get non-shadowed template DO elements
            Create a space separated list of shadowing tokens (either name or type attribute)
        -->
        <xsl:apply-templates select="//template/do" >
            <xsl:with-param name="shadow">
                <xsl:for-each select="do">
                    <xsl:choose>
                        <xsl:when test="@name">
                            <xsl:value-of select="@name" />
                        </xsl:when>
                        <xsl:otherwise>
                            <xsl:value-of select="@type" />
                        </xsl:otherwise>
                    </xsl:choose>
                    <xsl:text> </xsl:text>
                </xsl:for-each>
            </xsl:with-param>
        </xsl:apply-templates>

    </wml:card>
```

```
</xsl:template>

<xsl:template name="Template.events">

        <xsl:if test="template/@ontimer">
            <xsl:attribute name="wml:ontimer">
                <xsl:value-of select="template/@ontimer"/>
            </xsl:attribute>
        </xsl:if>

        <xsl:if test="template/@onenterforward">
        <xsl:attribute name="wml:onenterforward">
            <xsl:value-of select="template/@onenterforward"/>
        </xsl:attribute>
        </xsl:if>

        <xsl:if test="template/@onenterbackward">
        <xsl:attribute name="wml:onenterbackward">
            <xsl:value-of select="template/@onenterbackward"/>
        </xsl:attribute>
        </xsl:if>

</xsl:template>

<xsl:template match="go">
    <wml:go>
        <xsl:copy-of select="@id | @class | @href |  @sendreferer | @method | @cache-control
| @accept-charset" />

        <xsl:choose>
            <xsl:when test="@enctype='multipart/form-data'">
                <xsl:attribute name="enctype">application/vnd.wap.wml.form.data</xsl:attribute>
            </xsl:when>
            <xsl:otherwise>
                <xsl:attribute
name="enctype">application/vnd.wap.wml.form.urlencoded</xsl:attribute>
            </xsl:otherwise>
        </xsl:choose>

        <xsl:apply-templates select="postfield | setvar" />
    </wml:go>
</xsl:template>

<xsl:template match="postfield">
    <wml:postfield>
        <xsl:copy-of select="@*" />
    </wml:postfield>
</xsl:template>
```

```
<xsl:template match="prev">
    <wml:prev>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="setvar" />
    </wml:prev>
</xsl:template>

<xsl:template match="noop">
    <wml:noop>
        <xsl:copy-of select="@*" />
    </wml:noop>
</xsl:template>

<xsl:template match="refresh">
    <wml:refresh>
        <xsl:copy-of select="@*" />
        <xsl:apply-templates select="setvar" />
    </wml:refresh>
</xsl:template>

<xsl:template match="setvar">
    <wml:setvar>
        <xsl:copy-of select="@*" />
    </wml:setvar>
</xsl:template>


    <xsl:template match="text()">

    <xsl:choose>
        <xsl:when test="function-available('wmlexpr:WMLExpression')">
                <xsl:value-of select="wmlexpr:WMLExpression(string(.))"  disable-output-
escaping="yes" />
        </xsl:when>
        <xsl:otherwise>
                <xsl:copy-of select="." />
        </xsl:otherwise>
    </xsl:choose>

    </xsl:template>


<xsl:output
    method="xml"
    indent="yes"
    doctype-system="wml20.dtd"
    doctype-public="-//WAPFORUM//DTD WML 2.0//EN"
    media-type="application/wml+xml"
    />
```

```
</xsl:transform>
```

6.2. The org.wapforum.wml.WMLExpression Java Class

```
/*
   @Wireless Application Protocol Forum, Ltd. 2001.

    Terms and conditions of use are available from the Wireless Application Protocol Forum
    Ltd.
    Web site (http://www.wapforum.org/what/copyright.htm).
*/
package org.wapforum.wml;

public class WMLExpression {

    public static final String WMLExpression (String text)
    {
        StringBuffer str = new StringBuffer(); //Return string
        StringBuffer varname = new StringBuffer(); //Variable name
        String conv = null; //Conversion attrib.
        String startvar = null; //either $( or $

        int len = text.length();
        int i = 0;
        char ch;
        while (i < len)  {
            ch = text.charAt(i);
            switch (ch) {
            case '<':
                    str.append ("&lt;");i++;
                    break;
            case '&':
                    str.append ("&amp;");i++;
                    break;
            case '$':
                    i++;
                    if (i == len ) {
                        str.append('$');
                        return str.toString();
                    }

                    startvar = "$";
                    conv = null;

                    ch = text.charAt(i);
                    switch(ch) {
                        case '$':
                            //Escaped $
                            str.append('$');
                            i++; //Skip one $
                            if (i == len)
                                return str.toString();
                            break;
                        case '(':
                            //Starts with $(
                            startvar = "$(";
                            i++;
                            if (i == len)
                                return str.append(startvar).toString();
                            ch =  text.charAt(i);
                            //Fall through
                        default:
                            //read var name
                            varname = new StringBuffer();
                            if ( !(Character.isLetter(ch) | ch == '_' ) )
                            {   //Invalid character
                                    str.append(startvar).append(ch);
                                    i++;
                                    break;
                            }
                            varname.append (ch);
                            i++;
                            for (;;)
                            {//Loop to read varname
                                if (i >= len) {
                                    if (!startvar.endsWith("("))
                                        return str.append(createGetvarElement(varname,
conv)).toString();
                                    else
                                        return str.append(startvar).append(varname).toString();

                                }

                                ch =  text.charAt(i);


                                if (ch == ':')
                                {   //Conversion

                                    if (!startvar.endsWith("(")) {
                                        //Invalid if variable did not start with $(
                                        str.append(startvar).append(varname) ;
                                        break;
                                    }

                                    i++;//Skip ':'
                                    int lpar = text.indexOf(")",i);
```

```
                                    if (lpar != -1) {
                                        conv = text.substring(i,lpar).toLowerCase();
                                        if ( !( conv.equals("noesc") | conv.equals("unesc") |
conv.equals("escape"))) {
                                                str.append(startvar).append(varname).append(':');
                                                break;
                                        }
                                    } else {
                                        str.append(startvar).append(varname).append(':');
                                        break;
                                    }
                                    i += conv.length() ;//Skip escape directive

                                    if (i >= len ) {
                                        return
str.append(startvar).append(varname).append(conv).toString();
                                    }
                                    ch =  text.charAt(i);
                                    if (ch != ')') {

    str.append(startvar).append(varname).append(conv).append(ch);
                                        break;
                                    }
                                    i++;//Skip ')'

                                    str.append (createGetvarElement(varname, conv));
                                    break;
                                } else if (!(Character.isLetterOrDigit(ch) | (ch == '_')))
                                {
                                    if (startvar.endsWith("(") ) {
                                        //Variable must end with )
                                        if ( ch == ')' )
                                            i++;
                                        else {
                                            str.append(startvar).append(varname);
                                            break;
                                        }
                                    }
                                    str.append (createGetvarElement(varname, conv));
                                    break;
                                }

                                varname.append(ch);
                                i++;
                                }
                            break;
                    }
                    break;
            default:
                    str.append (ch);i++;
                    break;
              }
          }
          return str.toString();
      }

      static String createGetvarElement(StringBuffer varname, String conv)
      {
          String getvar1 = "<wml:getvar name=\"";
          String getvar2 = "\" conversion=\"";
          String getvar3 = "\" />";

          StringBuffer getvar = new StringBuffer();

          getvar.append(getvar1);
          getvar.append(varname);
          if (conv != null) {
              getvar.append(getvar2);
              getvar.append(conv);
              }
          getvar.append (getvar3);

          return getvar.toString();
      }

}
```

7. Using the XSLT Transformation Sheet (Informative)

The transformation rules are defined as an XSLT transformation sheet, so any of the XSLT processors available on the Web can be used to transform WML 1 documents into WML 2 documents. The Web sites *www.xml.com* and *www.xmlhack.com* have references to XSLT resources.

Since the transformation sheet in section 6 relies on the `xsl:script` element, in order to call the Java class extension function, an XSLT version 1.1 compliant processor is required. For example, the SAXON (*users.iclway.co.uk/mhkay/saxon/*) processor can be used.

It is possible to use an XSLT version 1.0 processor as well. Most XSLT 1.0 processors provide a way to call extension functions such as Java classes. Refer to the documentation. For example, the XT (*www.jclark.com/xml*) processor and the Microsoft MSXML (*www.microsoft.com/xml*) can be used.

Appendix A. Change History (Informative)

Type of Change	Date	Section	Description
Class 0	6-November-2001		The initial version of this document.