Developing Mobile Applications

WML – the HTML of mobile phones

Why WML

- Limited devices
  - screen
  - processing power
  - communication links
- HTML, as used, was not well defined and the content available was suitable for limited devices.
- Phones are phones, there are things that you can do that you can not to on a PC.

XML

- A language framework
  - characters and tokens
  - basic grammar rules
- XML languages
  - defined by a DTD – document type definition, or a XML Schema

XML basics


```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE test PUBLIC "TEST Language"
  "http://www.foo.com/DTD/test.dtd">

<!-- a comment -->

<foo title="Foo" id="G123">
   <grk num=”3”>some text</grk>
   <bar/>
</foo>
```

Escaping characters

- Special characters:
  - < &
  - < &
- Whole sections can be escaped from parsing:
  - <![CDATA[*anything&&%&!(/")(/"0980*]]>
  - useful when we have dynamic content
  - anything?

A DTD for WML


```
<!ELEMENT wml (head?, template?, card+)>
<!ATTLIST wml
   xml:lang        NMTOKEN      #IMPLIED
   id              ID           #IMPLIED
   class           CDATA        #IMPLIED">
>
<!ELEMENT card (onevent*, timer?, (do | p | pre)*)>
<!ATTLIST card
  title             %vdata;     #IMPLIED
  newcontext        %boolean;   "false"
  ordered           %boolean;   "true"
  xml:lang          NMTOKEN     #IMPLIED
  %cardev;
  %coreattrs;
>
```

Valid and well formed

- A document i well formed if
  - it comply with the basic rules of XML
- A document is valid if
  - it is well formed and
  - comply with the specification of a DTD or XML schema

WML

- A *valid* XML document
- A WML document is called a deck.
- A deck consist of one or more cards.
- A card is similar to a web page.

Why decks and card

- Why group pages into a deck?
  - *The idea is that since it takes two seconds to get anything you might as well send more than one page in each transaction. It is also easier to navigate through a set of cards rather than one large page.*
- How can this be done in HTML?
  - navigation inside page
  - HTTP tricks

WML example


```
<?xml version="1.0"? >
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
        "http://www.wapforum.com/DTD/wml13.dtd">

<!-- This is a comment -->

<wml>
   <card title="DMA" id="home">
     <p>Our First Card</p>
   </card>
</wml>
```

simple anchor


```
<wml>
   <card title="DMA" id="home">
     <p>Our first card, and a
       <a href=”#next”>link</a> to the second.
     </p>

   </card>
   <card title=”DMA” id=”next”>
     <p>Our second card.</p>
   </card>
</wml>
```

a real anchor


```
<wml>
   <card title="DMA" id="home">
     <p>A larger
      <anchor title=”Go to next” accesskey=”1”>
        <go href=”next.wml” method=”get”/>
        link
      </anchor>
      that can be accessed by a key.
     </p>
   </card>
</wml>
```

post


```
<wml>
   <card title="DMA" id="home">
     <p>A larger
      <anchor>
        <go href=”next.wml” method=”post”>
          <postfield name=”user” value=”me”/>
        </go>
        link
      </anchor>
      that will post information.
     </p>
   </card>
</wml>
```

prev

```
<wml>
   <card title="DMA" id="home">
     <p>A larger
      <anchor>
        <prev/>
        link
      </anchor>
      that will go back.
     </p>
   </card>
</wml>
```

templates


```
<wml>
   <template>
     <do type=”home” lable=”Home”>
       <go href=”#home” />
     </do>
     <do type=”contact” lable=”Contact”>
       <go href=”#contact” />
     </do>
   </template>
   <card title="DMA" id="home">
     <p>This is the first page.
     </p>
   </card>
   <card title=”DMA” id=”contact”>
     <p>Don't call us, we will call you.</p>
   </card>
</wml>
```

Do types

- The <do .. > types work as a hint to the browser of the intended use. The browser might map the link to a specific key.
- Don't rely on this and do not confuse users!
  - `accept`
  - `prev`
  - `help`
  - `reset`
  - `options`
  - `delete`

timer


```
<wml>
   <card ontimer=”#next>
     <timer value=”50” />
     <p>This is the first page.</p>
   </card>
   <card  id=”next”>
     <p>This is 5 sec later.</p>
   </card>
</wml
```

WML is *event driven*.

Events

- Timer
  - ontimer: timer expire
- Enter
  - onenterbackwards: entering using prev
  - onenterforwards:entering using go
- Pick
  - onpick: selecting an item
- What can we do:
  - do, refresh, URL,.... scripting

selection


```
<wml>
   <card>
     <p>
      <select name=”foo”>
       <option value=”first”>Dog</option>
       <option value=”second”>Cat</option>
      </select>
     <br/> Make a selection and then go to the
     <a href=”#next”>next page</a>.</p>
   </card>
   <card  id=”next”>
     <p>U selected the $(foo) choice.</p>
   </card>
</wml>
```

input

```
<wml>
  <card title="Input">
   <p>Name: <input name="name" size="20"/><br/>
   </p>
   <p><a href="#next">next</a></p>
  </card>
  <card id="next">
   <p>Hello $(name)</p>
  </card>
</wml>
```

variables

- Variables are global; can be accessed across decks.
- Will only hold strings.
- Can be *escaped* to work as a URL
  - done automatically in `href` attributes
- A new context will erase all variables.
  - `newcontext` attribute in card element

variables

- Important:
  - part of WML not a scripting add-on
- But:
  - WML does not contain any conditional, arithmetic nor string manipulation statements
- WMLscript
  - more on client side scripting later

It is a phone

- Wireless Telephony Application Interface
  - Specifies an API for handling phone calls
  - API through URL or WMLscript
  - most operations can only be done with the operators support and are seldom used

wtai: make call


```
<wml>
   <card>
    <p>Talk to
     <a href=”wtai://wp/mc;0709757812”>me</a>!
    </p>
   </card>
</wml
```

The user is always prompted before making a call .

wtai: phone book entry


```
<wml>
   <card>
    <p>Enter
     <a href="wtai://wp/ap;0709757812;Johan">
       Johan </a> in the phone book.
    </p>
   </card>
</wml
```

Build a phone book on the net!

images

2000

80x60
wbmp

2006

240x320
jpg/gif

What is this

SVG Tiny

- Vector graphics can save bandwidth but more important it scales to the size of the screen.
- All new phones support SVG Tiny which is a subset of the SVG basic specification.

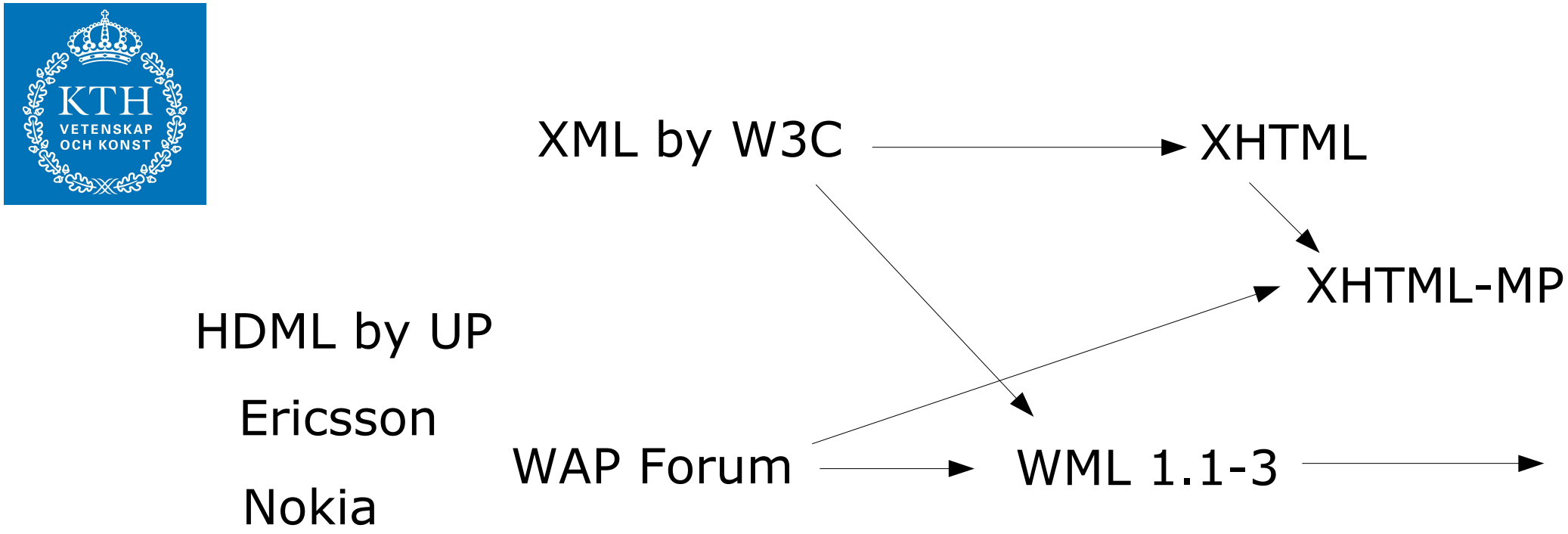
SVG


```
<svg version="1.1" viewBox="0 0 200 200"
   preserveAspectRatio="none"
   xmlns="http://www.w3.org/2000/svg"
   xmlns:xlink="http://www.w3.org/1999/xlink"
   >
<title>Simple Ellipse Example in SVG</title>
<desc>Simple Ellipse Example in SVG</desc>
<ellipse cx="100" cy="100" rx="80" ry="50"
      stroke="blue"
      stroke-width="2"
      fill="green"/>
<line x1="10" y1="30" x2="180" y2="130"
      stroke="blue"
      stroke-width="5"/>
</svg>
```

WBXML

- A XML document is not compact nor easy to parse.
- Most of the code in the parser is used to tokenize the document.
  - why not do the tokenization on the server side
  - also saves a lot of bandwidth
- WBXML
  - WAP binary XML
  - not only for compression!

WML history


cHTML by DoCoMo
XML by W3C
XHTML
XHTML-MP
HDML by UP
Ericsson
Nokia
WAP Forum
WML 1.1-3

Reading

- www.wapforum.org
  - WAP-191 WML
  - WAP-268-WTAI
- www.w3.org
  - XML
  - WBXML
- www.w3schools.com
  - WML tutorials

Lab session

- Create a WML 1.x site on your home directory ~name/index.wml
- Experiment with different tags..
- Use Opera or WinWAP as browser for rapid prototyping.
- Use validator.w3c.org to check your site.
- Use phones to se if it works in real life.

Will this fly?