CGT 141/CPT 141 Lecture 22 WK 14
Wireless Internet Technology

WAP

What is WAP?

- **W**ireless **A**pplication **P**rotocol
- It is an application communication protocol
- A protocol designed for micro browsers, enables creation of web applications for mobile devices
- Leading standard for information services on wireless terminals
- Inherited from Internet standards (HTML, XML, TCP/IP), used for handheld devices (ie. mobile phones)

Where did WAP come from?

- WAP is published by the WAP Forum which was founded in 1997 by Ericsson, Motorola, Nokia, and Unwired Planet
- The companies which make up this forum now represent over 90% of the global handset market

Purpose of WAP?

- To enable easy, fast delivery of information and services to mobile device users

What technologies does WAP use?

- WAP uses a Microbrowser to fit into small, wireless terminals. These Microbrowsers communicate with this protocol.
- Microbrowsers are small pieces of software that make minimal demands on hardware, memory and CPU
- Uses the markup language WML to display information

WML

What is WML?

- **W**ireless **M**arkup **L**anguage
- A Markup Language inherited from HTML
- Based on XML, so it is stricter than HTML
- Used to create pages that can be displayed in a WAP browser
- Intended for use in specifying content and user interface for narrowband devices, including cellular phones and pagers

Benefits of WML:

- Text presentation and layout
    - WML includes text and image support, including a variety of formatting and layout commands
- Deck/card organizational metaphor
    - all information in WML is organized into a collection of cards and decks;

    - pages in WML are called “decks” and decks are constructed from a set of “cards”
- Inter-card navigation and linking
    - WML includes support for explicitly managing the navigation between cards and decks
- String parameterization and state management
    - all WML decks can be parameterized, using a state model

What constraints do wireless devices have which WML addresses?

- Small display and limited user input facilities
- Narrowband network connection
- Limited memory and computational resources

Creating a WML Deck

- This example has only one card, a WML page may have multiple cards within a deck
- Notice also that certain formatting tags may be used to format text

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>

    <!-- This is the Login Card -->
    <card id="LoginCard" title="Login">
    Please enter your user name: <input name="UserName" size="15"/><br/>
    </card>

</wml>
```

WML tags

- Case sensitive
- Restricted to tags that are necessary, extras that would cause for more memory usage that is not necessary are eliminated
- Valid WML elements:
    - Deck/Card elements:
        - wml, card, template, head, access, meta
    - Event elements:
        - do, ontimer, onenterforward, onenterbackward, onpick, onevent, postfield
    - Tasks:
        - go, prev, refresh, noop
    - Variables:
        - setvar

    - User input:
        - input, select, option, optgroup, fieldset
    - Anchors, Images and Timers
        - a, anchor, img, timer
    - Text formatting:
        - br, p, table, tr, td (table tags have restricted usage)
- Form of WML elements:
    - <element> element value </element> (same as XML or XHTML)
    - use
 when element has no value, such as br, (also as XHTML)

Another WML example

- This example anchors text to take the user back to the previous card

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>
    <card>
        <p>
            <anchor>
            Previous Page
            <prev/>
            </anchor>
        </p>
    </card>
</wml>
```

Last WML example:

- This example provides the user with several choices to choose between
- Once the user has selected a choice and moves to the next card, the second card displays the selection of the previous card

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>

    <card id="card1" title="Tutorial">
    <do type="accept" label="Answer">
        <go href="#card2"/>
    </do>

    <p>
        <select name="name">
```

```
        <option value="HTML">HTML Tutorial</option>
        <option value="XML">XML Tutorial</option>
        <option value="WAP">WAP Tutorial</option>
        </select>
    </p>
    </card>

    <card id="card2" title="Answer">
    <p>
        You selected: $(name)
    </p>
    </card>

</wml>
```

WMLScript

What is WMLScript?

- WML uses WMLScript to run simple code on the client
- A JavaScript language
- They are not embedded within WML pages, pages contain references to script URL's

When is WMLScript used?

- Validation of user input
- To generate dialog boxes locally to view them faster

Example of how a WMLScript is referenced from a WML page:

In this example, if you were to select the "Go" label, the external script would then direct you to Google.

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>

    <card id="no1" title="Go to URL">
        <do type="options" label="Go">
        <go href="check.wmls#go_url('Search')"/>
        </do>
    </card>

</wml>
```

And here is what the WML page “check.wmls” would look like

```
extern function go_url(the_url)
{
        if (the_url=="Search")
        {
            WMLBrowser.go("http://www.google.com")
        }
}
```

Note that the “extern” before the function description allows other WML events or functions to call this particular function. Without the “extern” this function would be private

Bluetooth

What is Bluetooth?

- Radio-frequency standard allowing electronic equipment (computers, pagers, PDA’s, keyboards, headphones, etc) which traditionally communicate through wires to communicate with each other
- There are several other wireless options out there for communication between peripheral devices, but Bluetooth does not present some of the same drawbacks
    - ie – infrared requires a line of sight
- Bluetooth avoids radio interference by transmitting at a very low signal strength
    - Somewhat small range of signal (10 meters)
    - Signal is not interrupted by walls and other obstructions
    - Small change of interference with televisions, portable phones, etc.
- Creates a personal-area network (PAN)
- Devices communicate on this network without any direction from the user and determine whether they have information to share or not

Useful web sites for these topics:
http://www.w3schools.com/wap/wap_intro.asp
http://www.wapforum.org/faqs/index.htm
http://computer.howstuffworks.com/bluetooth.htm