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DDR Workshop

WURFL, WALL and the community of mobile developers

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MAKING THE MOBILE INTERNET WORK FOR YOU

Device Fragmentation is deeper than Standards Can Reach

Same mark-up, Same business logic, same device manufacturer,yet... you need to build **two** applications

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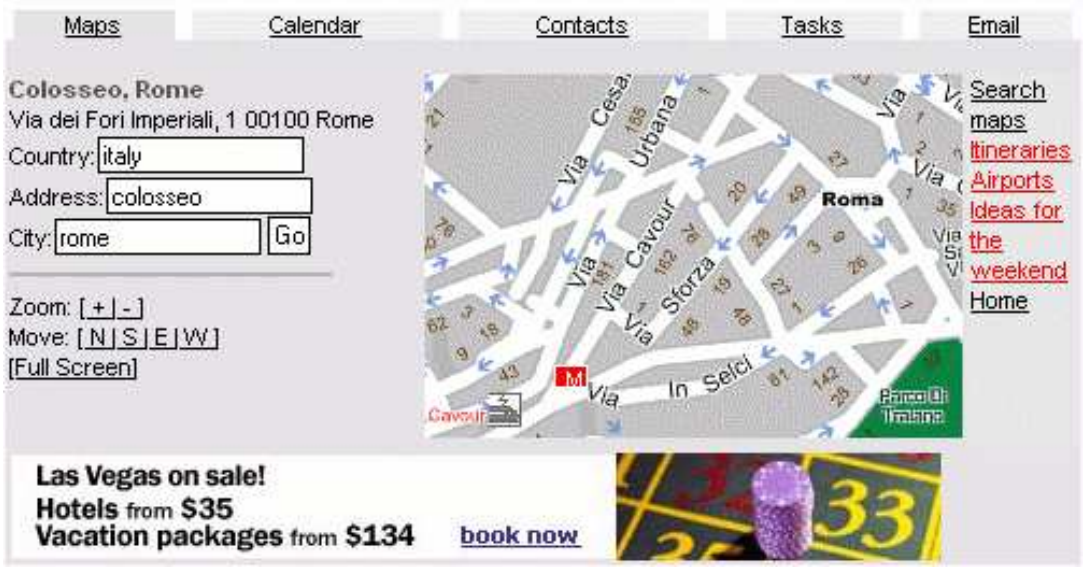
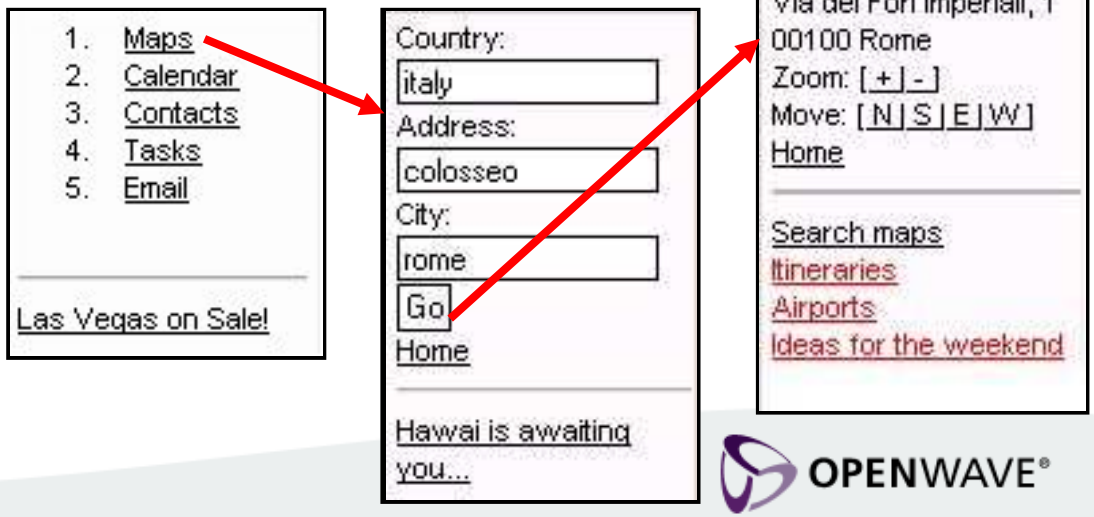
Device Fragmentation is not only about standards



Show me a standard that can turn one application into the other automatically (or just theoretically!) and I will be **very** impressed!



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WURFL and WALL

WURFL and WALL (1 of 2)

WURFL and WALL address device fragmentation

- Free tool for the Developer community
- Open Source
- http://wurfl.sourceforge.net
- http://developer.openwave.com/dvl/tools_and_sdk/wurfl_and_wall/

WURFL = Wireless Universal Resource FiLe

- Repository of device capabilities maintained by the developer community
- Open Source Middleware: Java, PHP, Perl and more
- Popular with Content Providers, i.e. Model is validated by a large installed base.
- Adopted by some operators too

WALL = Wireless Abstraction Library

- Builds on top of WURFL
- JSP tag-library
- HTML-like: produces WML, XHTML-MP and Compact-HTML
- Simple to use and deploy.

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WURFL and WALL (2 of 2)

WURFL Core Team:

- Luca Passani: Openwave Consultant.
- Andrea Trasatti: Independent

Extended Team:

- Between 40 and 200 (varying degrees of effort)
- **Hundreds of enthusiastic users around the world!**

The Community!!!

- 2000+ strong developer mailing list (WMLProgramming on Yahoo groups)
- Core Team has **high credibility** with the developer community.
- The result of years of work helping mobile developers.

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WURFL and WALL: Under the Hood (I)

- Driving Concept from the beginning of the WURFL project:

  "***Essential device information MUST be publicly available***"
- XML File containing device profiles
- Comprehensive Device Repository
  - 7000+ devices (including firmware subversions of the same device)
- Device profile is a list of capabilities (AKA attributes) and values.
- Device Info from several sources:
  - **UAProf** (arguably, WURFL = UAProf on Steroids)
  - Published Documentation, Developer Report, Actual Testing
- Hierarchical Structure
  - Fall-back
- Extensible
  - Add arbitrary capabilities relevant to your domain. Patch file.
- Open data, Open Source Middleware
- Java, PHP, Perl, Python, Ruby

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WURFL and WALL: Under the Hood (II)

Basic Middleware Functions

Given a User-Agent String
=> Return a WURFL Device ID:

```
UA: Nokia3650/1.0 (4.52)
   SymbianOS/6.1 Series60/0.9 Profile/MIDP-1.0 Configuration/CLDC-1.0

RETURNS

WURFL ID:nokia_3650_ver1_sub452
```

Given a WURFL ID and a Capability Name,
=> Return a Capability Value:

```
WURFL ID: nokia_3650_ver1_sub452

Capability: colors

RETURNS

Capability Value: 4096
```

The combination of the two functions allows to derive the value of a given device capability exclusively out of the data carried by an HTTP request.

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WURFL and WALL: Under the Hood (III)

```
<device
  user_agent="Nokia3650/1.0 (4.17) SymbianOS/6.1 Series60/1.2 Profile/MIDP-1.0 Configuration/CLDC-1.0.0"
  fall_back="nokia_3650_ver1" id="nokia_3650_ver1_sub417100"/>
<device
  user_agent="Nokia3650/1.0 (4.51) SymbianOS/6.1 Series60/1.2 Profile/MIDP-1.0 Configuration/CLDC-1.0“
  fall_back="nokia_3650_ver1" id="nokia_3650_ver1_sub451"/>
<device
  user_agent="Nokia3650/1.0 (4.52) SymbianOS/6.1 Series60/0.9
              Profile/MIDP-1.0 Configuration/CLDC-1.0"
  fall_back="nokia_3650_ver1" id="nokia_365
<device
  user_agent="Nokia3650/1.0 SymbianOS/6.1 Series60/1.2 Prof
  fall_back="nokia_3650_ver1" id="nokia_3650_ver1_sub004400
<device
  user_agent="Nokia3650/1.0 SymbianOS/6.1 Series60/1.2 Prof
  fall_back="nokia_3650_ver1" id="nokia_3650_ver1_subSN0440
```

```
<device user_agent="Nokia3650" actual_devi
              fall_back="nokia_generic_ser
              id="nokia_3650_ver1">
   <group id="product_info">
      <capability name="model_name" value=
   </group>
        :
   <group id="display">
     <capability name="columns" value="15"
     <capability name="rows" value="6"/>
  </group>
  <group id="image_format">
    <capability name="bmp" value="true"/>
    <capability name="colors" value="4096"
   </group>
</device>
```

The fall_back attributes allows the API to programmatically find the “parent device”.

If a capability is not defined in the profile of the first device found (this case), following the chain of device “inheritance” the API will eventually get to a device profile that defines the capability and its corresponding value.

In this example, first match is simply a sub-version of the Nokia 3650. Fall-back leads into the top 3650 device profile, which contains the value of the ‘colors’ capability.

API Examples

Java API

```
UAManager        uam = ObjectsManager.getUAManagerInstance();
CapabilityMatrix cm = ObjectsManager.getCapabilityMatrixInstance();
     :
String wurfl_id =
   uam.getDeviceIDFromUA("Nokia3650/1.0 (4.52) SymbianOS/6.1 Series60/0.9"));
     :
String capability_value =
   cm.getCapabilityForDevice(wurfl_id,"colors");
```

PHP

```
require_once('./wurfl_config.php');
require_once(WURFL_CLASS_FILE);
  :
$wurflObj = new wurfl_class();
  :
$wurflObj->GetDeviceCapabilitiesFromAgent("Nokia3650/1.0 (4.52)");
  :
$max_colors = $wurflObj->getDeviceCapability('colors');
```

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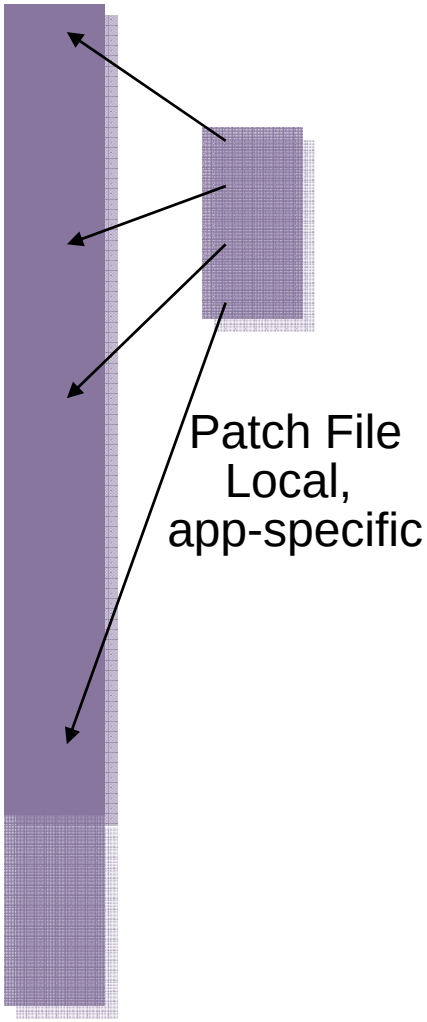
WURFL is Extensible (Patch file)



The "**Patch file**" is a small XML file that can enrich WURFL data dynamically.

- Patch file is 100% in the domain of the application developer.
- Add application-specific capabilities
- Add information about yet-to-be-released devices
- WURFL and local WURFL patch can be updated virtually independently.

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Areas in Wireless Development Covered by WURFL

WAP 1 and 2, CHTML browsing	Model differences in mark-up support by different browser for different mark-ups. Useful to improve user-experience during WAP browsing.
MMS	Can send, receive MMS. Built-in Camera. Max dimension for MMS image. Animated GIF support…
Downloadable Objects: Ringtones and Wallpapers	Download Fun support, ringtone support (mono and polyphonic, number of voices for poly), downloadable audio formats (wav,mp3, midi), wallpaper formats (gif, jpg, png), video
J2ME	JSR supported, proprietary extensions (Nokia UI, Motorola LWT, Siemens), max storage size, max jar size, screen dimensions, canvas dimensions, graphical and sound formats supported…
Image and Sounds formats	Similar to downloadable objects, but may differ (for ex, device may support download of JPG image, but not display JPG images in the WAP browser)
Video Streaming	Support for different formats and codecs for video streaming.

WURFL Tools

WURFL Filter

Choose the WURFL capabilities that you want and let the filter build a WURFL t

Capability Box:

Enter your list of capabilities (separated by a comma ',') in this text area (we recommend that you copy and paste them from a local text file on your PC or workstation.

set capabilities | set all | clear all | reverse set | count capabilities

Set Capabilities = check boxes by using list of capabilities
Set All = set all capability boxes
Clear All = clear all capability boxes
Reverse Set = import capability names of checks boxes into list
Count Capabilities = Return the number of select capabilities

display

- resolution_width
- resolution_height
- rows

Toggle this group

product_info

- brand_name
- model_name
- is_wireless_device
- device_claims_web

Toggle this group

image_format

- wbmp
- bmp
- epoc_bmp

:FL Filter/mDevInf/...

Device: **mot_e4_ver1_sub419**
User-Agent: MOT-E4/4.1.9 UP/4.1.19i
Fall-back: mot_e4_ver1
Brand and Model: ,

List of capabilities for **mot_e4_ver1_sub419**

display / product_info / image_format / xhtml_ui / wta / storage / nextel_application / bugs / markup / cache / chtml_ui / sound_format / wml_ui / drm / sms / wap_push / mms / security / streaming / object_download / j2me /

Mobile Device Information v0.5

File Tools Help

Device | Search | Results | User Profiles

product_info | security | sms | sound_format | storage | streaming | wap_push | wml_ui | wta | xhtml_ui
bugs | cache | chtml_ui | display | drm | image_format | j2me | markup | mms | object_download

doja_1_0	n/a	false	j2me_middle_softkey_code	n/a		
doja_1_5	n/a	false	j2me_midi	n/a	false	
doja_2_0	n/a	false	j2me_midp_1_0	n/a	false	
doja_2_1	n/a	false	j2me_midp_2_0	n/a	false	
doja_2_2	n/a	false	j2me_mmapi_1_0	n/a	false	
doja_3_0	n/a	false	j2me_mmapi_1_1	n/a	false	
doja_3_5	n/a	false	j2me_motorola_lwt	n/a	false	
doja_4_0	n/a	false	j2me_mp3	n/a	false	
j2me_3dapi	n/a	false	j2me_mp4	n/a	false	
j2me_3gpp	n/a	false	j2me_mpeg4	n/a	false	
j2me_aac	n/a	false	j2me_nokia_ui	n/a	false	

Search | Clear All

Value
90
40
2
11
90
35
true
false
true
false

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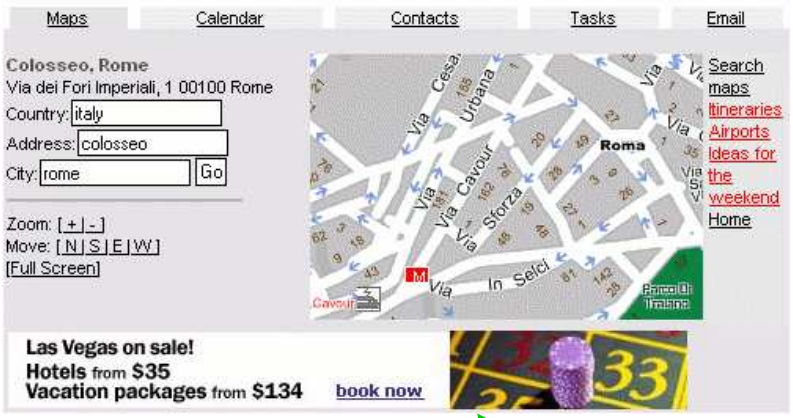
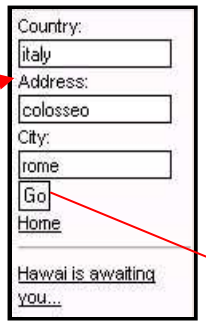
One Step back: looking at the our original problem with WURFL eyes





Use existing capabilities **or** add one **custom** capability to the WURFL repository (possibly by managing the WURFL patch file)

```
screen_width >= 500

has_stylus_and_large_screen {true|false}
```

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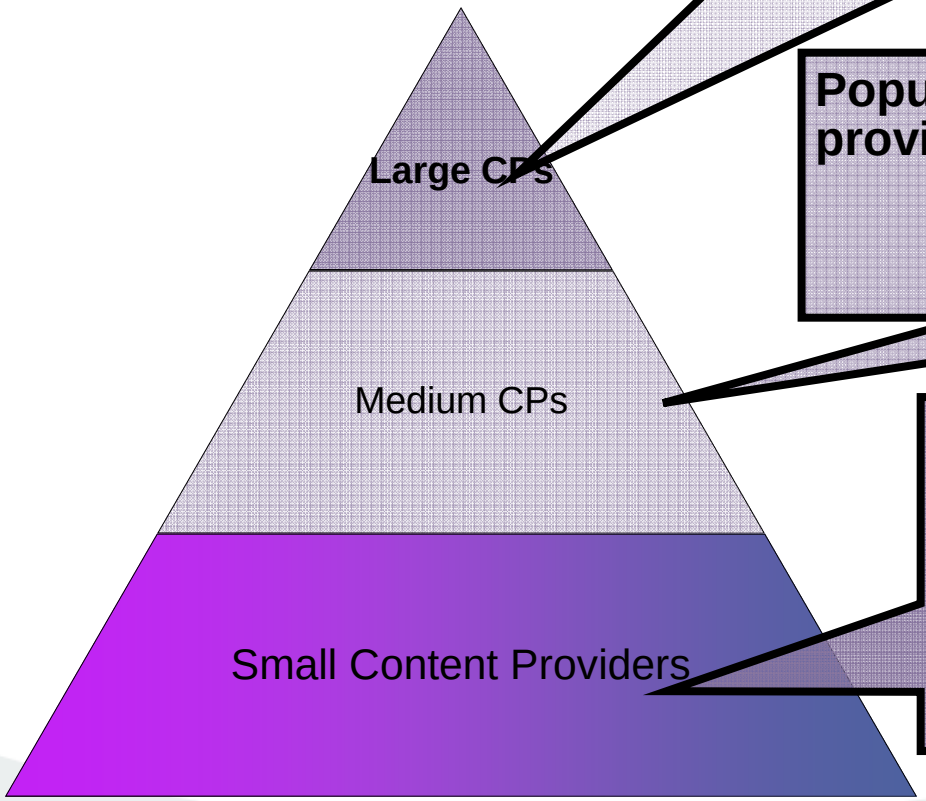
Who Is Using WURFL: Content Providers

WURFL is also popular with large Content Providers, which would normally be able to acquire a commercial multi-serving framework.



Popular with Medium-sized content providers too.

Really Popular with small-sized content providers, i.e. the ones that typically don't have the budget for commercial solutions in this area.

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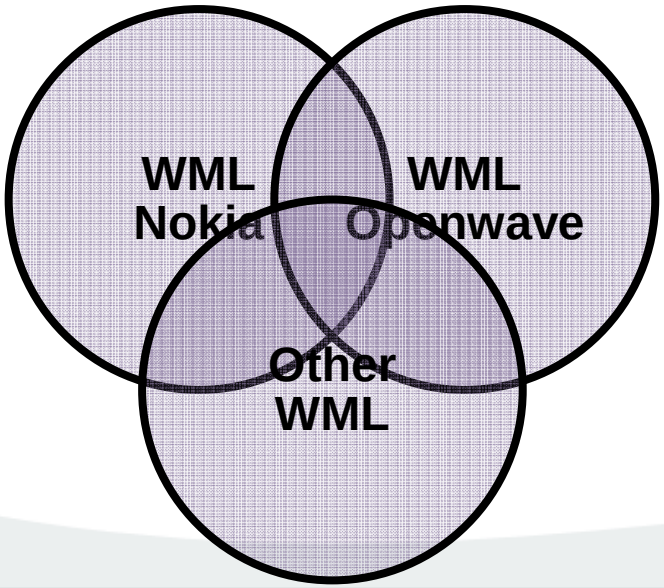
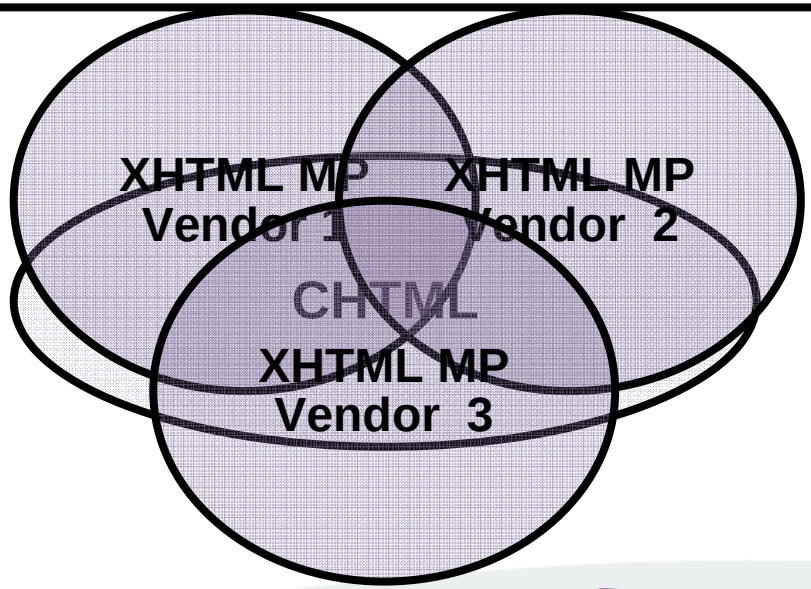
Issues with Internet Browsing on Mobile Devices

WALL,
the Wireless Abstraction Library,
addresses this issue





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WALL in Action

```
<wall:menu colorize="true" autonumber="true">
  <wall:a href="http://url1" title="Games">Games</wall:a>
  <wall:a href="http://url2" title="Horos">Horoscopes</wall:a>
  <wall:a href="http://url1" title="Kids">Kids</wall:a>
  <wall:a href="http://url2" title="Movies"><wall:b>Movies</wall:b></wall:a>
  <wall:a href="http://url1" title="Music">Music</wall:a>
  <wall:a href="http://url2" title="Radio">Radio</wall:a>
```

XHTML-MP (advanced)

&

Compact-HTML (iMode)

- All wireless mark-ups are supported
- Intra-markup optimization
- New devices are supported (add profile to WURFL)
  - key WURFL capability: **`preferred_markup`**
- WALL is not just Menus.
- There is more..

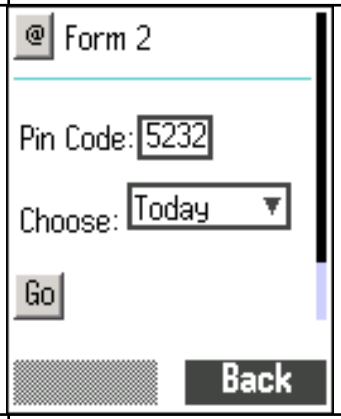
WALL in Action (II)

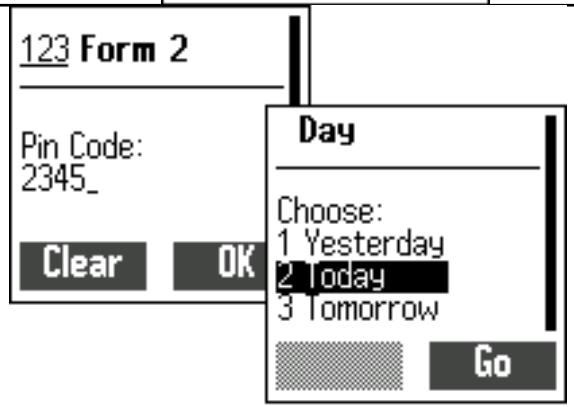
Form 1

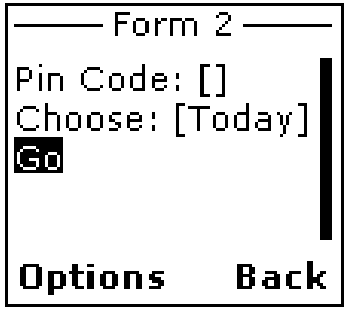
No WML support, full form support.

Form 2

WML forms too, limited widget set.

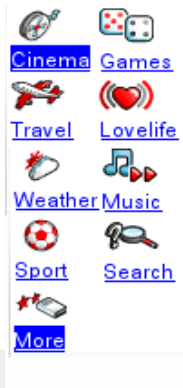


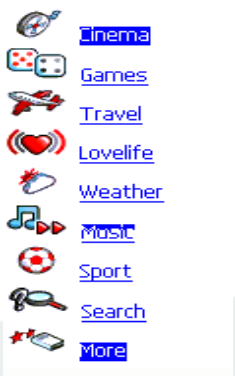


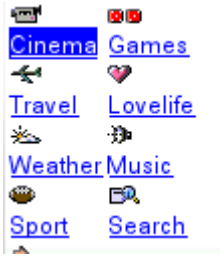


Coolmenus

Graphic-intensive portals (a-la Vodalive)







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WALL in Action (III)

- Use WALL to intelligently filter service availabaility.
- JSTL, Java Standard Tag-Library
  - JSR 52, **http://www.jcp.org/en/jsr/detail?id=52**
- Elegant way to do conditional programming in JSP views.
- WURFL capabilities can be accessed from WALL through JSTL

```
<c:choose>
 <c:when
   test="${capabilities.jpg && capabilities.resolution_width > 142}">
<img src="crazy-frog.jpg" alt="Crazy Frog" /><wall:br/>
<wall:a accesskey="1" href="dl.jsp">Download Wallpaper 2£</wall:a><wall:br/>
<wall:a accesskey="2" href="dl.jsp">Download Screensaver 2£</wall:a><wall:br/>
     :
 </c:when>
 <c:otherwise>
   Your Device is not supported
   by this service, sorry!
     :
 </c:otherwise>
</c:choose>
```