Wonderful World of Wireless
WD200W

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Wireless Possibilities: The Hype and the Reality

› Wireless Is Here, It’s For Real
› How many here have a wireless phone?
› How many phones provide wireless-web access?
› Initial hype may have overstated value
› Costs, usefulness of service not justifiable
› Challenge using micro-devices for display/data entry
› Still, many wireless services exist
› New technologies coming:
› Better phones, networks
› Better underlying technology
› Will look at these, how to get started today
› While consumer, business markets mature

Who’s Using Wireless Today?

› Major brand sites
  - ABCNews.com (abcnews.go.com)
  - ESPN (espn.go.com)
  - USA Today (usatoday.com)
  - Wall Street Journal (wsj.com)
  - Barnes and Noble (mobile.bn.com)
  - Weather Channel (weather.com)
  - CBS Sportsline.com (cbs.sportsline.com)
  - Edmunds.com (mobile.edmunds.com)

› Major tech sites
  - AOL (aol.com/anywhere)
  - Yahoo (yahoo.com)
  - eBay (ebay.com)
  - Expedia.com, travelocity.com
  - Mapquest.com/wireless/
  - E*Trade (www.etrade.com), Schwab
  - ZDnet (zdnets.com)

Some Unique Mobile Applications Available

› Biztravel (biztravel.com)
  - comprehensive travel information for frequent business travelers
› iQradio (iqradio.com)
  - interactive nationwide radio station directory
› NextBus (nextbus.com)
  - Real-time arrival info for arriving bus or train (in select cities, tracked via satellite)
› TrafficStation (trafficstation.com)
  - Personal Traffic Advisor, area reports, personalized, route-specific traffic reports, Personal Traffic Advisor Telewarning System
Wireless Means Many Things
- Most obvious example: Phones
- Other examples:
  - Pagers
  - PDAs (portable digital assistants)
  - Laptops with wireless modems
  - Wristwatches
  - Automobiles
  - Clothes
- Differences are more than physical dimensions:
  - Radical new approaches to communicating

Many Ways to Wireless Programming
- Most prominent in US today is WAP (wireless access protocol)
  - And its associated WML (wireless markup language)
- Others, equally popular in different parts of world:
  - I-mode, Palm, PocketPC, J2ME and more
  - Bluetooth not really in same space
- Differences more than just language:
  - Some are much more suitable to data remaining in device, resuming later connection, complete control of interface, and more

Wireless Adoption WorldWide
- Adoption rates worldwide are quite varied, based on several factors, some not obvious:
  - Telecommunications monopolies, if any
  - Or too many carriers, splintering the market
  - Wireless infrastructure, including:
    - Cost (per minute vs. flat rate) for wireless service
    - Availability of SMS, GSM, other technologies
    - Availability of higher speed, later technology
    - Challenges in getting land-lines for internet access
    - Wireless access may be more popular where land-lines are expensive or even unavailable
  - Clearly a difference between consumer and business

Wireless Web Development Approaches

WAP
- Wireless Application Protocol:
  - Early leader in wireless platform development
  - Predominant approach in US
  - Supported by nearly all newly manufactured phones
- Corresponding Wireless Markup Language (WML):
  - WAP is akin to HTTP, as WML is akin to HTML
  - Very familiar for web developers
    - Easy to learn, easily supported by CF, JSP, etc.
  - Managed by the wapforum (wapforum.org), supported by hundreds of members
    - Will discuss in more detail later

I-Mode
- Predominant wireless platform in Japan:
  - Huge adoption rates among Japanese consumers
  - Making inroads into other markets worldwide
- NTT Docomo is state-run phone company
  - Has monopoly, mandated this platform
  - Still, has its strengths:
    - Regarded for its highly graphic interface
    - Facilitated by efficient, unified network
    - Dramatically facilitated by always-on nature
  - And flat-rate pricing
  - Many strengths are not I-mode, per se!
Palm

- Palm Computing platform is predominant PDA
  - Personal Digital Assistant
- Differs from WAP, I-mode
  - Device is intended as PDA, with wireless capability
  - In some ways, is more useful device for info mgmt
  - Stronger data entry capabilities (stylus, keyboards)
- Wireless capabilities seem grafted on, though
  - Requires separate modem, wireless service
  - Content must be written specifically for Palm
  - Palm realizes need to make inroads into enterprise

PocketPC/Windows CE

- Windows CE was early implementation of Windows on PDA’s
  - New incarnation is PocketPC platform (specs, API)
  - Making inroads into, stealing from, expanding upon Palm market
  - Strength is integration of familiar windows apps, interface
  - Available on multiple PDAs: Compaq, HP, others
- Microsoft recognizes need for micro-device and wireless support
  - Familiar development platform for windows developers
  - Like Palm, has strength over WAP as a real computing device with local storage, computing power

J2ME

- Sun Microsystems has split the Java 2 platform into 3 editions:
  - J2SE (standard), J2EE (enterprise), J2ME (micro)
- Java 2 Micro Edition
  - Highly optimized Java runtime environment
  - Targeting a wide range of consumer products:
    - Including pagers, cellular phones, screenphones, digital set-top boxes and car navigation systems
- J2ME itself further split into profiles, i.e., MIDP
  - Like Palm, PocketPC, supports device data storage, computing
    - Full range of capability of the Java platform

Others

- Symbian Epoch OS
- RIM Blackberry (device and platform)
- Application Service Providers
  - ThinAirApps
  - Oracle
  - others

One Approach: WAP Application Development

WAP Architecture
About WML

- Looks and acts very much like HTML
  - Designed for the limited display and keyboard input features of today’s phones
  - Generally can only be viewed in phones or “phone emulators”
- There are significant differences. Not really HTML-like.
  - Differences in tags
  - Differences in how it’s coded

“Hello World” In WML

```xml
<?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>Hello World!</p>
  </card>
</wml>
```

- Notice: 2 different head tags, different WML tags
- Case of tags is sensitive, all tags must be closed
- Might be stored as login.wml
- WML has support for <input>, other data entry elements

Creating WAP Applications in CF/JRun

```xml
<CFCONTENT type="text/vnd.wap.wml">
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN" "http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
  <card>
    <p>
      <CFOUTPUT>#application.storename# Login</CFOUTPUT>
    </p>
    <do type="accept">
      <go href="login.cfm?login=$(uname)"/>
    </do>
  </card>
</wml>
</CFCONTENT>
```

- Notice: CFCONTENT tag;<?xml> tag on same line
- Also performing login, using input elements, passing URL var
- Might be stored as a “login.cfm”
- JRun: replace CFCONTENT with equivalent:
  ```jsp```
  ```@content_type="text/vnd.wap.wml"```
  ```Servlet: response.setContentType(“text/vnd.wap.wml”)```

How to View/Develop WML Pages

- Can any web browser view WML pages? No!
  - Only phones and phone emulators can view output of a page sent as WML
  - Later “resources” slide will show where to obtain
  - Let’s see an example
- Any editor, of course, can be used to develop them
- Most wireless phone providers now support WAP
- Most recently made wireless phones support WAP
  - Some support HDML only
    - Handheld Device Markup Language, WML's predecessor

Usability/Style Guidelines

- Some tools assert they can convert any content to WML
- Really best to create custom WML content, targeted for phones and mobile users
  - Easy, drill-down navigation
  - Few keystrokes
  - Remember past visits
- OpenWave has a list of several style guides from carriers and their own
- See web sites in later “Resources” page for still more

Which Horse to Bet On?
Choosing Among The Approaches

Issues:
- Your level of control over platform/device choice for your customers
- Market penetration of platform/devices if no control
- Cost to implement, develop, maintain
- Background of current developers
  - Easy for web developers to learn, implement WAP
  - Requirements for device info storage, programmability of interface
  - WAP generally not suited to local data storage, limited interface
- Importance of data entry in the application

Common Challenges

Developer challenges
- Interface challenges on tiny devices
- Limited bandwidth, sometimes disconnected
- Market penetration for phones, networks, services
- Supporting multiple approaches in a single application
- Support multiple devices within each approach

Market/culture issues
- Security
- Location sensing
- Push/notification

WAP Challenges

Development Challenges
- Browser incompatibility issues
- Browser detection in server-side code
- Problems using cookies (not always supported)
- Error handling challenges (returned in HTML)

Other Challenges
- Security (WTLS/SSL, and “wapgap”)
- Using XML/XSLT
- WMLScript

See Books, Articles on “Resources” Slide

Coming Changes/Improvements

New devices, networks, increased bandwidth
- Devices providing better input, more storage
- More devices supporting J2ME
- G3 (very high bandwidth) networks being laid
  - GPRS, Edge, GSM/WCDMA

Platform improvements
- Resolution of security, location sensing issues

Time will allow:
- Industry support for changes
- Market support for new, existing applications

Bottom line: easy to get in now, experiment, watch

Emulators

Easiest may be: http://wapsilon.com/
- Doesn’t require installing software
- Emulates Nokia phones. Reasonable WML support

Openwave emulator
- Available at developer.openwave.com

Nokia, Ericsson have own emulators available
Most are free for development

Where to Go From Here

Note: This slide is not in your binder
General Wireless Development Learning Resources

- Books
  - New ones coming out all the time
  - Search Amazon.com for WAP, I-mode, J2ME, Palm

- Magazines
  - M-Business, Wireless Business & Technology

- Web Sites
  - Portals: ayg.com, wirelessdevnet.com, allnetdevices.com
  - Magazines sites: mbizcentral.com, wbt2.com
  - Phone manufacturers: nokia.com, ericsson.com
  - Service providers: attws.com, sprintpcs.com, nextel.com, verizonwireless.com, etc.
  - Wrox mailing lists: p2p.wrox.com

CF/JRun-Specific Wireless Development Learning Resources

- Allaire.com wireless section of DevCenter
- Professional WAP, chapter 11, “ColdFusion and WAP” (written by yours truly)
- WAP Development with WML and WMLScript (Ben Forta)
- Several articles in ColdFusion Developers Journal
  (by Ben, myself, others)
- CF Wireless mailing list:
  http://www.bromby.com/cfwireless/

Questions & Answers

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