Device Awareness and Content Adaptation

Your new knowledge of mobile markup syntax and best practices makes you ready to adapt Mobile Web content to increase compatibility and usability across mobile devices and browsers. Adapting a Mobile Web site to target mobile browser and device capabilities is achieved by applying two core principles of Mobile Web development: device recognition and content adaptation.

Device awareness is attained by inspecting the User-Agent and other HTTP request headers to identify Web traffic from mobile devices and provide information about device characteristics. Developers use a device database and accompanying API to identify the device that originates the Web request. Once the device is identified, the device database provides detailed properties about the mobile device and its browser. For example, a Mobile Web developer might pass the User-Agent request header value that follows to a device database API:

Mozilla/5.0 (iPhone; U; CPU iPhone OS 2_2_1 like Mac OS X; en-us)
 AppleWebKit/525.18.1 (KHTML, like Gecko) Version/3.1.1 Mobile/S6H11
 Safari/525.20

The device database identifies this Web client as an Apple iPhone running version 3.1.1 of its operating system and using a Safari Web browser. With an identified device, the Mobile Web developer can use the API to learn more about the iPhone model. The device database reports that its screen size is 320 x 480 pixels, the screen can rotate between landscape and portrait orientations, its browser supports JavaScript and AJAX, and the tel: protocol is preferred for embedding phone numbers as links in Web pages, among other characteristics.

Several open-data, open-source and proprietary mobile device databases provide mobile browser and device characteristics to developers. This chapter examines two popular device databases: WURFL and DeviceAtlas.

Content adaptation is the process of optimizing mobile markup to target the capabilities and avoid the flaws of the mobile device and its browser. Basic content adaptation
identifies Web requests from mobile devices and desktop browsers, sending the former to a Mobile Web site and the latter to a desktop-optimized Web site. More advanced content adaptation uses device characteristics (obtained through device awareness) as criteria for changing the functionality or design of the Mobile Web site. Content adaptation groups mobile devices and browsers according to shared capabilities, identifies the ways in which a Mobile Web site might adapt, and implements rules for adapting the site to each device group.

This chapter describes how to use device awareness to identify mobile devices and implement content adaptation in a Mobile Web site.

**Device Awareness**

Device awareness is the process of using information in a Web request to identify a mobile browser or device and determine its capabilities. Learning the mobile device characteristics allows a Mobile Web site to make choices about adapting mobile markup, styles, scripting, and page layout to provide the best possible mobile user experience. This section describes the mechanics of device awareness and example implementations using two popular device database technologies.

**Using HTTP Request Headers to Identify Mobile Devices**

Device awareness identifies mobile devices and browsers by inspecting the metadata in the HTTP headers of a Web request. Three request headers are especially important in identifying a device:

*The User-Agent header* identifies the mobile browser and almost always also identifies the mobile device manufacturer and model.

*The X-Wap-Profile header* provides a URL to a User Agent Profile in Resource Description Framework (RDF) file format (an XML dialect used for W3C specifications). The User Agent Profile is a document that describes the capabilities of the mobile device and browser. Some mobile devices provide the User Agent Profile URL in the Wap-Profile or profile headers.

*The Accept header* provides a list of MIME types for content supported in the browser or device.

Listing 4-1 shows HTTP request headers for the Blackberry Curve 8310, a smartphone made by Research in Motion. The User-Agent, X-Wap-Profile, and Accept headers are in bold type for readability.

**Listing 4-1. HTTP Request Headers for Blackberry Curve 8310**

```plaintext
Accept-Language: en-US,en;q=0.5
x-wap-profile: "http://www.blackberry.net/go/mobile/profiles/uaprof/8310/4.2.2.rdf"
Host: learnto.mobi
Accept-Charset: ISO-8859-1,UTF-8,US-ASCII,UTF-16BE,windows-1252,UTF-16LE,windows-1250
User-Agent: BlackBerry8310/4.2.2 Profile/MIDP-2.0 Configuration/CLDC-1.1 VendorID/102
```