

Authoring for Multiple WAP devices

Absolutly NOT.... OUI

The Wireless FAQ

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Wireless Developers Mailing Lists

Much of the information in this FAQ comes from a selection of mailing lists dedicated to wireless developers. These lists are well worth checking out.

[The WML and WMLScript Programmers List](#)

Low traffic, moderated list for WML and WMLScript developers. The list is reachable via the web and via email.

[The WMLScript Discussion Forum](#)

Discussion forum which is made up of several moderated lists for wireless developers in general. The lists are reachable via the web and via email.

[The wap-dev Mailing List](#)

Low traffic list for WAP/WML developers. A list archive and subscription tool is available via the web.

[The OUI-support List](#)

Group for technical questions about the Openwave Usability Interface (OUI) development library.

[The wap-dev Mailing List](#)

Low traffic list for WAP/WML developers. A list archive and subscription tool is available via the web.

Note! Remember to check this FAQ before asking a question on these mailing lists

The Wireless Wall of Fame

Put faces to the names of some of the famous, and not yet famous people of the wireless world in [the Wireless Wall of Fame](#).

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1.1 What does WAP mean?



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1.1 In short, what is WAP?

WAP stands for Wireless Application Protocol. The idea comes from the wireless industry, from companies such as Openwave.com, Nokia and Ericsson. The point of this standard is to serve internet contents and internet services to wireless clients, WAP devices, such as mobile phones and terminals. The authoritative source for WAP is www.wapforum.org.

WAP is not a single entity, but a list of protocols and specifications.

Related information

[WAP Forum](#)'s publicly available specifications for [WAP 1.0](#), [WAP 1.1](#), [WAP 1.2](#), [WAP 1.2.1](#) and July 2001 conformance release of [WAP 2.0](#) specifications .

Chapter 1 in "[Professional WAP](#)" from Wrox

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1.2 In short, what is WML?

WML stands for Wireless Markup Language, and is what HTML is to a web browser. It is based on [XML](#), or rather it is an XML application. If you're going from HTML to WML, with no prior knowledge of XML, chances are you'll find WML *very* strict. Just like HTML and XML, WML is read and interpreted by a browser built into the WAP device. For WAP devices, the browser is commonly called a micro browser, indicating that its capabilities are somewhat limited. These capabilities are of course also limited to the capabilities of the WAP device in which it lives.

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1.3 How long will WAP last?

I get asked this question so often that to save myself some time, I'm adding it to the FAQ.

First of all let me remind you that these are my personal views, and the bottom line is that it is the consumer who has the faith of WAP in his hand. Good technology has been wasted before just because the market has chosen something else to support. Take the VHS, Beta and Video2000 home video standards of some years back. Technically speaking, Video2000 offered the best quality, but the market chose VHS which is probably the worst of the three.

Anyway, on to the future of WAP. Unfortunately WAP is currently being marketed as "the internet on your phone". I'm sure that most WAP devices will be mobile phones, but WAP is not in any way limited to phones. Further, anyone who has worked with WAP knows that it's wrong to say that WAP is a "web" browser as such.

WAP can on the other hand offer services and applications similar to the ones you find on the internet in a very thin client environment. Thin meaning virtually no processor power, very limited display rendering capabilities and so on. How well these applications work are up to the developers. It's true that WAP currently limits the developers in many ways, but the technology is new, and there are ways around almost every obstacle.

Many see the death of WAP when they are shown hand held micro PCs and PDAs, arguing that the limited display size and lack of a proper keyboard will mean the end of WAP. Personally I think this is wrong. First the amount of devices you'll end up with. Most people will need to carry **both** their mobile phone and their micro PC/PDA. My opinion is that the consumer will think; the more I can do with just one device the better. Then there's the question of cost. Two devices cost more than one. The majority of WAP users should be normal people, and they'll want to spend as little as possible.

Manufacturers have and will try to solve these problems by combining the PC and the mobile phone. The problem then becomes size. For a device like this to be usable by a human, there are certain restrictions. First of all the input interface. Currently the best input interface available is the common qwerty keyboard. For this keyboard to work, the keys and the space between them must have a minimum size or only very small children will be able to use it. Second, the output interface. The human eye I guess is best suited to look at a display down to five inches. Anything smaller than this and you'll need to move the device closer to your eyes. A display like this will make a hand held device very large and impossible to put in a normal sized pocket. The typical mobile phone display is about two inches. If you want to present a normal 640 by 480 image on a two inch display, you'd have to have the display surgically attached to your cornea. I doubt this would sell.

The typical combination PDA and mobile phone today is something like the Nokia Communicator. The drawback with this is that you cannot comfortably use the device unless you have one hand free to hold the device or that the device is firmly seated. A normal mobile phone can be operated with just one hand, both holding and "typing". Some argue that it is impossible to type using the numeric keypads of a mobile phone. It's true that it's more complicated than using a normal keyboard, but then again you're not meant to be writing an essay on a WAP device. And the billions of SMS messages sent from mobile phones every day at least proves that it's not impossible.

The bottom line is that WAP is **not** "the web" on your mobile phone, and that WAP should have all the prospects of a long life as long as developers understand that it's what's inside the applications that matter, and not necessarily how it is packaged.

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1.4 Why use WML when you can use HTML?

First of all, the WAP specifications require the use of WML. You might have heard of WAP devices that support HTML, but this really isn't the case. There are several other wireless devices similar to WAP devices, but these use either straight HTML (such as devices with the [Microsoft Mobile Explorer](#) which supports both HTML and WML. The MME devices are really two completely separate devices in one. Then there's the variants on HTML such as the [iMode](#) browsers which use [Compact HTML](#). In short, if we're talking about WAP devices, the markup language is WML.

There are many reasons why WML is used in the WAP environment instead of HTML. Currently the most important reason is that WML requires very little bandwidth resources compared to HTML. Obviously, with the introduction of technologies that provide higher bandwidth for wireless devices, this reason becomes less important. However, it will take many years before these higher bandwidth technologies are available globally.

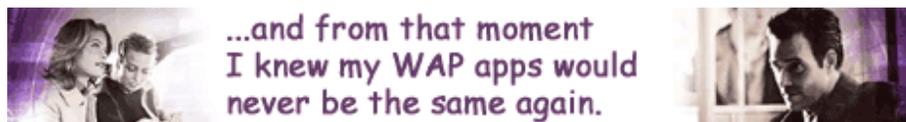
Another important reason is that HTML requires relatively great processing strength to render. Processing strength means power, and on a wireless device that means energy from batteries. Less processor power means longer lasting batteries.

Further, HTML really requires larger displays than the display on a device such as a mobile phone. Sure, it's possible to have large displays on mobile phones or other mobile devices, but the larger the device is, the less mobile it will be. Even with iMode that supports colors and a page layout similar to simple HTML, the displays are already at the maximum size you would want to carry every day.

Be sure to read "[How long will WAP last?](#)".

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1.5 What is a good service for the mobile internet?

Obviously, services that you use while being "mobile" are in general better suited for the mobile internet than the classic "web". Some great applications are starting to emerge, but this is just the tip of the tip of the iceberg.

This section will feature some ideas on applications (so called "killer apps") that will benefit from the mobile internet.

Location based services

In general Location Based Services are services that basically know where you are located in the world, and can provide information relevant to this position. In the very near future, a mobile device will be able to tell a web server where it is. But, if you can't wait, you could simply just ask the user.

A good example of this, is a service that displays the location of different types of public transport in a city. Let's say you're running to the bus stop, late for a meeting, and since buses are never on time, you need to find out if the bus has just left the stop, or is just ten minutes late.

At the bus stop there's usually a time table, but this one has a unique number printed on it. You access the public transportation site, and key in the number. The web server at the other end then knows exactly where you are, and can display the location of the nearest bus since the bus has a GPS system on board. Here in Oslo, the capital of Norway, we have, in addition to buses, subway, trams and trains. The buses do currently not have GSP on board, but some of the trams have. The subway and the trains do not, but their locations are known via the subway and train control center. In short, this system can be enabled today without having to wait for any new technology.

When the technology becomes available to obtain a user's location automatically, a good location based service would be a city parking service. Instead of having a normal parking meter, you'll have a board with instructions and again a unique number for each parking lot. When you want to park, you simply tell the system which exact spot you want to pay for, and for how long you want to pay. When there's five minutes left of your time, the system sends you an SMS saying that you either need to move your car or pay more. If you leave early, you can optionally tell the system this, and you end up paying for exactly the time you spend. The system now knows pretty much which parking spots are available and which isn't. For instance in London, where there's some ten spots for each car, the system can tell you where the nearest available parking spot is because it knows where you are, and it knows where the available spots are. To check that people are not cheating the system, the meter maids :-)) now tell the system which lot they want to check and the system will be able to tell them exactly where there's supposed to be a car, and where there shouldn't be one.

How often have you been stuck in a traffic jam just a few miles from where you normally exit the motorway. Do you stay on the motorway and hope that the queue clears up in a few minutes, or do you exit immediately and take another route? In England, most of the major motorways have traffic cameras that can help you look ahead at the traffic. Simply by telling a system roughly where you are, for instance by telling it the motorway number and the nearest junction, the system can bring up an image of the traffic ahead.

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1.6 In short, what is WMLScript?



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1.6 In short, what is WMLScript?

WMLScript is a client side script language based on [ECMAScript](#). It might seem a lot like JavaScript, and in a very general way it is meant for the same type of application which is to actually run simple code on the client side rather than just render a display which is the job of the markup language. WMLScript has obviously been modified to fit the limitations of the WAP environment.

This FAQ features a whole growing WMLscript section which starts [here](#).

Related information

Chapter 6 in "[Professional WAP](#)" from Wrox

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1.7 What is a WML deck of cards ?

WML "pages" or WML documents are referred to as decks. Each deck consists of one or more cards. Each deck begins and ends with the <wml> tag, and each card begins and ends with the <card> tag.

When the WML micro browser accesses a WML document (or deck), it reads the whole deck, and navigation between the cards in this deck is done without the need to load any more data. This is important to know, because once you've loaded a deck, all cards within it stays (statically) in the WML micro browser memory until the browser is instructed to reload the whole deck.

If you are familiar with the <a name> tag of HTML, <card> tags of WML is very similar.

```
<wml>

  <card id="start_menu">
    ...some code...
  </card>

  <card id="purchase">
    ...some more code...
  </card>

</wml>
```

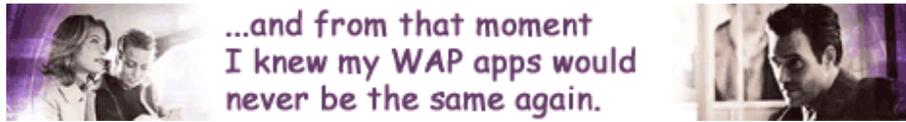
Decks and cards are accessed this way: [*deckname*][*#cardname*]. If the *deckname* is omitted, the browser will look for a card named *cardname* within the deck currently in memory. If the *#cardname* is omitted, the browser will load the deck called *deckname* and jump to the first card in the deck. If you include both *deckname* and *#cardname*, the browser will load the deck called *deckname* and jump to the card called *#cardname*. In other words pretty much the same way the HTML <A NAME> tag works.

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

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1.8 How do I start writing WAP applications?

All you really need is a text editor :-) but you'll find that using a developer toolkit can save you lots of time until get used to the WAP environment.

But first of all you should visit the authoritative source for all things WAP; [WAP FORUM](#).

[Registering](#) yourself with the Nokia WAP Developer Forum and then downloading for instance the [Nokia WAP Developer Toolkit](#) should probably be one of your first steps. The toolkit comes with PDF files that will give you references on the WML and WMLScript command syntax and general WAP insight. The Nokia kit requires JRE (Java Runtime Environment) v.1.2.2 or higher. A link is available at the same location.

Note that a toolkit might be designed for developing applications for WAP devices in general, not mobile phones in particular. What you make with a WAP developer kit may look nothing like what you get when used from the micro browser in a mobile phone. To be sure things look the way you want, you either need the actual WAP device, such as a mobile phone, or an emulator.

Nokia has an emulator for the 7110 phone which comes with the Nokia WAP SDK 2. The emulator is in effect identical to the 7110 it emulates - including the bugs, and in this case that is a good thing because you want to avoid them. The Nokia SDK also includes a small WAP server which lets you read WML decks off local drives or any HTTP server.

[Register](#) and check out the [Openwave.com](#) developers' site. Openwave.com provides the UP.browser which is as far as I know the most widely used browser, especially in the US. Openwave.com provides a [UP.SDK](#) available for download, after you have registered.

For the Ericsson R320 and the R380, which is available early in 2000, you should [register](#) and check out [Ericsson's Developer's Zone](#) for developer kits etc. For the R380, there's a very good emulator available at [Symbian](#) available for download without the need to register at the Ericsson Developer's Zone. Ericsson does not seem to have a publicly available emulator for the R320.

[Motorola](#) has development [tools for both WAP and Motorola's VoxML](#). After you have [registered](#) you can download all the software.

[WAPmine](#) has a stand-alone application called [WAPPage](#) which is a WYSIWYG editor with an XML tree view for editing WML code. Requires only limited knowledge of WML tags.

If you are developing applications for the public, you want to test these applications on as many WAP devices (or their emulators) as possible. Just as you would test your HTML documents on several browsers. Note that the differences between two WML micro browsers will be much more noticeable than the differences between two HTML browsers.

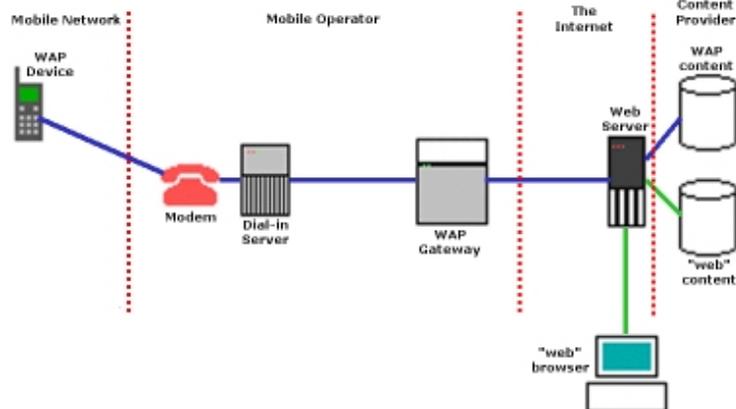
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1.9 How does a WAP device connect to the internet?

The normal implementation of a WAP scenario looks pretty much like this:



In the figure above, starting from the left, you'll find the mobile WAP device attached to the mobile network (GSM, CDDA, etc) which dials the modem attached to a dial-in server (RAS, or Remote Access Service). This server gives the WAP device access to the protocols it needs. These are the same lower level protocols as a normal Internet Service Provider will give you. This is known as PPP or Point-to-Point Protocol.

These protocols are used to access the next step in the chain, the WAP gateway, in this figure hosted by the mobile operator. The WAP gateway is the link between the wireless and the "web" world, basically giving the WAP device access to the common internet.

Another way of explaining it, and in a bit more detail would be to say that when you type in the URL for a site on your WAP device, for instance <http://wap.colorline.no/> the WAP device first checks if it already has an open connection, if not it dials up the PPP provider as described above. After the PPP provider has given the WAP device the required protocols and assigned it an IP address, the request for the URL is sent to the gateway. The WAP gateway, now under "control" of the WAP device requests the URL with a normal HTTP request, such as `GET http://wap.colorline.no/`.

On the internet, there is a normal "web" server which in this case holds both WAP and "web" contents, which now receives the request to send out the contents located at the `http://wap.colorline.no/` URL. Also note the normal "web" browser at the lower part of the figure. The web server, depending on which type of browser it is talking to (WAP or "web"), sends out WAP, represented by the blue line, or "web" content represented by the green line.

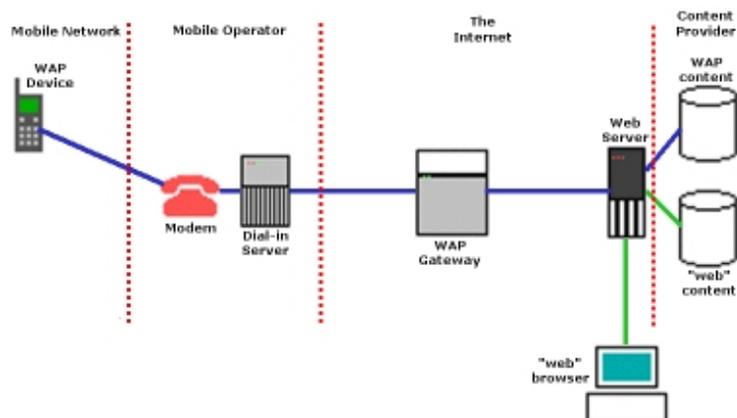
Following the requested content back to the WAP device, the contents, if they are in so called textual WML code (the human readable type), the WAP gateway compiles the textual WML into so called tokenized WML, or WMLC, where basically the code is "compressed" down into binary data (the machine readable type). This tokenized WML is then passed back to the WAP device. If the contents from the web server is already in tokenized WML format, the WAP gateway skips this operation. The reason for the conversion from textual WML to tokenized WML is to reduce bandwidth usage. A WAP device's WML browser can only read tokenized WML.

Finally, back at the WAP device that requested the URL, the WML browser, when receiving the tokenized WML code renders the contents on the WAP device's display to present a card for the user.

This is how the majority of WAP devices is connected to the internet, and if you're completely new to WAP, you might want to get back to the more complex configurations below a bit later.

When the WAP device is configured to use a **public WAP gateway**, and not one that is hosted by the mobile operator, we basically move the WAP gateway out on to the internet. I repeat that this is **not** the normal way WAP devices are configured, but during development you might come across this. The figure then looks something like this:

1.9 How does a WAP device connect to the internet?

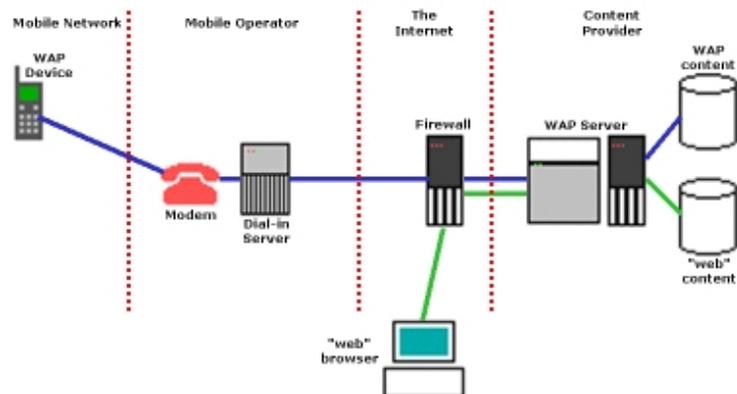


The WAP device now requests another WAP gateway, located on the internet. There's really not much more to say about this configuration other than that this is the typical configuration for developer who want to test a specific WAP gateway, for people who either have a crap or no WAP gateway provided by their mobile operator.

Now things start getting a bit more complicated...

If the content provider wants pretty much total control over the stream of data sent back and forth between the web server and the WAP device, they would install something called a [WAP server](#). This device is merely a web server and a WAP gateway in one, and it is usually located inside a firewall on the content provider's networks.

The configuration would look something like this:



(The firewall is of course optional, but highly recommended)

The WAP device gets internet access the same way as before, but from there it now connects to the firewall which accepts or rejects the connection depending on the firewall configuration. The firewall then passes the connection on to the WAP gateway inside the WAP server. In this configuration, the chain between the content server and the WAP device is point-to-point secured with the WTLS encryption protocol.

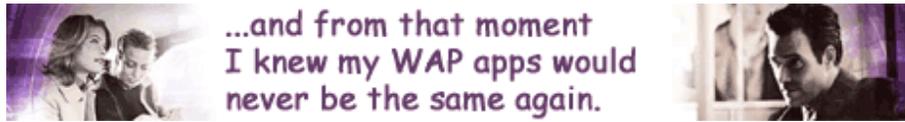
I would also like to remind you that a WAP server is not needed for normal sites. A plain web server will do just fine, thank you very much :)

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

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The Wireless FAQ

1.10 Is there a glossary of wireless technology expressions?

There are a lot of new terms and expressions, and there is a glossary just below. Note that with the amount of terms and expressions new to the WAP environment, the task of writing them all down is phenomenal. Links and more explanations are on the way. Hell, I might even get time to sort it alphabetically! Please be patient :-)

WAP Server	A frequently misused term. A WAP server by itself is really nothing more than a HTTP server - i.e. a web server. In order to confuse everyone, Nokia has a product which they call a WAP server which is a WAP gateway and a HTTP server all in one. I.e. this is actually a content providing servers and a gateway. The gateway takes care of the gateway stuff, and the web server provides the contents.
WAP Gateway	A WAP gateway is a two-way device (as any gateway). Looking at it from the WAP device's side, since a WAP device can only understand WML in its tokenized/compiled/binary format, the function of the WAP gateway is to convert content into this format. Looking at it from the HTTP server's side, the WAP gateway can provide additional information about the WAP device through the HTTP headers, for instance the subscriber number of a WAP capable cellular phone, its cell id and even things like location information (whenever that becomes available).
WML Card	A single WML block of navigation and user interface in a WML deck. A WML card must exist inside a WML deck containing one or more cards. WML decks are XML documents.
WML Deck	A collection of WML cards. The whole deck is loaded when the browser requests a URL, and access to individual cards in the deck can be specified in the URL.
SGML	Standardised Generalised Markup Language.
UA	User Agent. Software that interprets WML, WMLScript, WTAI and other forms of code.
WMLScript	Scripting language for WAP devices. Based on JavaScript, but less powerful.
XML	Extensible Markup Language. W3C's standard for Internet Markup Languages. WML is one of these languages. XML is a subset of SGML.
HDML	Handheld Markup Language
W3C	World Wide Web Consortium. http://www.w3c.org
WAE	Wireless Application Environment. (#NOK) The Wireless Application Environment specifies a general-purpose application environment based fundamentally on World Wide Web technologies and philosophies. WAE specifies an environment that allows operators and service providers to build applications and services that can reach a wide variety of different platforms. WAE is part of the Wireless Application Protocol.
WSP	Wireless Session Protocol. (#NOK) The Wireless Session Protocol provides the upper-level application layer of WAP with a consistent interface for two session services. The first is connection-mode service that operates above a transaction layer protocol, and the second is a connectionless service that operates above a secure or non-secure datagram transport service.
PDA	Personal Digital Assistant. Usually a hand-held device, such as the Palm Pilot . WAP isn't just for cellular phones.
Element	An element specify the markup and structural information in a WML deck. Some elements contain a start and end tag such as the <p> and </p> tag, others are single elements such as the tag.
DTD	Document Type Definition. (#NOK) The definition states which elements can be nested within others. A DTD defines that the names and contents of all elements that are permissible in a certain document, how often an element may appear, the order in which the elements must appear, whether the start or end tag may be omitted, the contents of all elements, that is, the names of the other generic identifiers that are allowed to appear inside them, the attributes and their default values and the names of the reference symbols that may be used.
WTP	Wireless Transaction Protocol
WTLS	Wireless Transport Layer Security. The "equivalent" to SSL (Secure Sockets Layer) widely used in the HTML world - although not identical in functionality.

1.10 Is there a glossary of wireless technology expressions?

WDP Wireless Datagram Protocol

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#NOK Taken from documentation provided by [Nokia](#)

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WAP 2.0, XHTML, IOT, OTA, WML..... WMLProgramming is "the" list!

The Wireless FAQ

1.11 Can you recommend any good WAP service providers?

We will be building a list of WAP service providers in this FAQ. If you are a WAP service provider, or know of one, please feel free to mail [me](#) and tell me about your service. Note, both free and commercial providers/developers are welcome to join the list.

You'll notice there are two lists. The first list contains providers that offer some sort of **free** WAP hosting service. The level of their services vary a lot - it is after all free.

Provider name	Type of services	Location
Tag Tag	Free WAP site hosting and online Java based WAP site editor	USA
wapHQ	Free and Independent Mobile Internet Access	Knutford, UK
WAP Service	Free WAP publication service	Sweden
Wappy	Free WAP site hosting and redirection service	The Netherlands
SoWAP	Free WAP site hosting. In French.	France
Freedom2Surf	Really a free HTML service provider, but they support PHP3 which makes it ideal for WAP content providing	England
Anytimenow.com	Free provider that offers 20MB space, online editing and storage of .wml and .wmls files. It also allows e-mail access via WAP, including Hotmail.	England
Hoiley.com	Free provider with offline WAP builder - WMLedit (still in "beta" version)	Germany
Waphome.ch	Free provider, in German. Includes online WAP based translator service.	Switzerland
WapSpy	Free provider, file upload, image libraries	Unknown
WapMine	Free provider, off-line WYSIWYG editor (WAPpage) for Windows	USA
WapDrive	Free provider (still in "beta" version)	Unknown
WAP Homes	Free provider (in German)	Germany
AddCom	Free provider (in German)	Germany
WapMatic	Free provider (in English and German)	Germany
DeZines Webhosting	Almost free provider with some support for WAP environments, including PHP.	International
Done	Free provider (in Turkish and English). Includes services like Dictionary, Portal and Mobile Entertainment	Turkey
Start.no	Excellent free WAP site "hotel", plus lots of other services. In Norwegian.	Norway

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The following list contains commercial (meaning they in some way charge for their services) WAP service providers. Because this list is

1.11 Can you recommend any good WAP service providers?

not meant as an advertisement board for commercial services, [the FAQ maintainer](#) decides what goes into the description field.

Provider name	Type of services	Location
wapHQ	WAP, Application hosting, Corporate Applications	Knutford, UK
Brainstorm	Wireless Application Service Provider and Developer	London, UK
IntegrationWireless	Company that creates dynamic wireless web sites with "m-commerce" in mind.	Washington, DC

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The Wireless FAQ

1.12 Is there a list of some great WAP applications?

Below you will find a list of some good WAP applications. These are not necessarily very useful or very high tech, but they are good examples on what WAP can provide compared to normal web applications. If you know of any such applications that would fit this list, please feel free to mail us, and we will most likely include it on the list.

Note that these services are most likely purely WML based, and clicking on the links below from your normal HTML browser will not give you the desired result. If someone could invent a way of sending URLs via SMS, I'd be happy to implement such a service here :)

Application name	Application type	Location
Translate!	Translates from and to English	http://www.zenith.i.e/wap/translate
WAP CAM	Online WAP camera with live images :-)	http://www.thewirelessfaq.com/demos.asp (Choose WAP CAM from the menu)
Domain Checker	Checks availability of .com, .net and .nl domains	http://kronkel.com/domain.wml
Demo Guestbook	Yeav Ming YiN's Demo Guestbook	http://cgi.cse.unsw.edu.au/cgi-bin/cgiwrap/s2231995/GB/GuestBook.wml
Polish Airport Information	Polish Airport Information (In polish)	http://www.polish-airports.com/wap/main.wml
SETI@Home Rank List	Displays your SETI@Home rank by Kuba Urbaniak	http://seti.matrix.pl/setiatwap/
Domain Check/Registration	Check and register .com, .net and .org domains	http://wap.tldnames.com/
PDFmail	Secure WAP e-mail with nice features.	http://www.sanface.com/wap/pdfmail.wml
WAPpop	Excellent GPL POP client for WAP devices	http://www.sanisoft.com/wappop/

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Some of these URLs are very long and will probably break your fingers if you try to type them in on a tiny phone. Instead, type in the URL below and you will be able to select the links from a menu.

<http://wap.colorline.no/links.wml>

Related information

[WAP Shareware's Software Directory](#)

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Authoring for Multiple WAP devices Absolutly NOT.... OUI

The Wireless FAQ

1.13 Can you show me some simple example code?

You might also want to check out the "[Beginner's Guide to WAP/WML](#)" article from [wap.com](#).

And eventually [this](#) article from [ASP Today](#) which also takes you through the first steps of writing [WMLScript](#) applications.

Most of you will probably find that it's easier to learn by doing rather than reading lots of documentation first and then try. I still recommend that you take at least a quick look at this FAQ before starting. This section of the FAQ will be short, and to the point. Those of you who already have prior knowledge of WAP will notice some white lies and shortcuts. Ignore them please. This section is for "newbies".

It's virtually impossible to get a grasp on WAP without some prior knowledge of things like "the web", HTML and web servers. This is required for this introductions. If you don't know any HTML, stop now and learn some before returning. Sorry.

Think of WAP as a concept. It's a set of definitions on how things should work. First of all forget all the hype you've heard. We'll stick to simple text, simple images and a simple input form.

On "the web", a "web page" is a file (document) stored on a web server. In WAP, the documents are called decks, and each deck contain one or more cards. The content of each card is what is displayed in the WAP browser window. On "the web" the common language for documents is HTML. In WAP the language is WML. The two look very similar, and for this we'll pretend that they are very similar (but they are in fact not).

A very simple HTML page may look like this:

```
<H1>Hello world!
```

The HTML code above may not be correctly formatted. First of all the end tag `</H1>` is missing, and there should really be a `<HEAD>` and `<BODY>` section etc etc. However, all normal web browsers will be able to display the page above correctly.

In WML it's a different story. The WML code is **much** more strict. For instance, all tags **must** be closed. In other words, it must be correctly formatted and there's no room for error. The reason for this is that a so called WAP gateway, with very little intelligence, will convert the WML code to a "compressed" format before it is sent to the WAP browser.

The same as above in WML would be something like this:

```
<?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="mycard" title="My first card">
    <p>Hello world!</p>
  </card>
</wml>
```

Most important is the header. The absolutely first character that is received by the browser **must** be the `<` character that starts the line `<?xml version="1.0">`. Any other character (even a space or a carriage return or other will break the card)

If you want, you can now take the code above and put it into a file called `world.wml`. Notice the `.wml` file extension. This is the common file extension for WML files. By now, you'll want to look at this file in a WAP browser. Go to [this](#) section and pick a software based browser that can run on your computer. Stay away from the SDKs and the Toolkits for now. These are development tools, and really overkill for your very first WML deck. WinWAP is a good starter.

Some of these software based browsers can open the files on a local drive, and that's good for testing, but you'll sooner or later want to look at this page from the internet. For that you need a plain old web server. Before you start with the web server, there's something you need to learn called MIME types.

When a browser requests a page from a web server, the web server sends out a string of information to tell the browser what kind of data the browser is about to receive. When your standard web browser asks for a web page, which are usually file with the `.asp` or `.htm` file

1.13 Can you show me some simple example code?

extension, the web server tells the browser that data of type **text/html** is coming. This is the MIME type for HTML documents. For WML, the MIME type is **text/vnd.wap.wml**. Very few web servers come pre-configured to handle WML files, so this is something you must do before you can start serving WML decks.

Have a look at [this](#) section which will give you a bit more details on how to configure a web server to handle the WML files.

The WML code above can be used to test the configuration, and when it works, you're ready to rock.

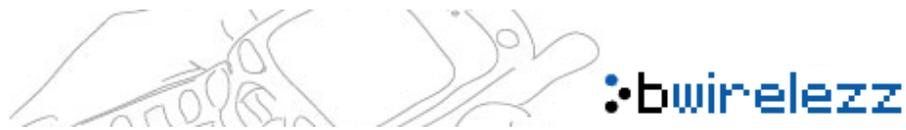
The WAP components, the WAP gateway and the WML browser are usually **very** strict when it comes to syntax errors. If you get **any** problems, strip the code down to the bare minimum. This is especially true for the first two lines of code which are the XML and DTD definitions, and if you type the code in manually there is lots of room for error. In the current version of WAP, the first 21 characters of code **must** be as follows. There must be no spaces, carriage returns, line feeds or other characters except what's below.

```
<?xml version="1.0"?>
```

If you're using a "software" WML browser like WinWAP or WapMan to test the code, it still might not work on a real WAP device. Real WAP devices are much more strict than the emulators.

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The Wireless FAQ

1.14 What is the Openwave Usability Interface (OUI) ?

You can use the Openwave Usability Interface (OUI) to build a single wireless application that delivers the best possible user experience to a wide variety of Wireless Application Protocol (WAP) devices. The current release of OUI is a developer library implemented in Java, plus tag libraries modeled on the Wireless Markup Language (WML) and XHTML Mobile Profile (XHTML-MP). OUI is released to developers free of charge.

Also see : http://developer.openwave.com/prod_tech/oui.html

you can find more information in [section 11](#) of the FAQ.

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1.15 We already have a WEB site, how do we get a WAP site?

Fast, Good and Free ...~~Pick Two :)~~
Pick Three!!! OUI

The Wireless FAQ

1.15 We already have a WEB site, how do we get a WAP site?

First of all, please understand that this document is really meant for companies who already have a web presence, and now want to get into WAP. It is not meant for WAP application developers or normal users. Although it might be interesting to read anyway :)

A lot of companies already have tons of information available on their web sites, and they want to make some or all of this available to mobile internet users. Remember, and this goes for anyone, that it's usually not just a matter of attaching a new device or installing a piece of software. Whatever the quality of what you publish is, it doesn't get any better by making it available via WAP. Think before you act, and think ahead. There's a big difference between the "normal" web and the wireless web in that the "normal" web has had several years to mature into this great thing. The wireless internet is probably at the stage the web was some five or six years ago, and will use a little time to eventually catch up with the "normal" web. Now is the time to act, but don't overdo it.

The same was true for the "normal" web. Many companies had a product range they wanted to sell via the web, and they basically just copied the contents of their printed catalogues and published them via the web. That wasn't very smart then, and it's not smart now. Just as your company had to start "thinking" web a few years ago, it must start "thinking" wireless web now.

Enough with the morals. The Independent WAP/WML FAQ highly recommends the "[Making existing web content available to the mobile Internet](#)" article available at wap.com which is very well written :-) and covers most of the methods of publishing new or existing information to mobile internet users.

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1.16 We already have a HDML site, how do we get a WAP site?

Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

1.16 We already have a HDML site, how do we get a WAP site?

All you need to know is provided by the following documents from Openwave:

<http://developer.openwave.com/support/techlib.asp>

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12.2 What is I-Mode, and where can I find out more about it?



The Wireless FAQ

12.2 What is I-Mode, and where can I find out more about it?

From the creators of i-Mode, [NTT DoCoMo](#)

The [i-Mode Service Guideline](#)

The guideline covers protocol stacks, security, user interfaces, downloading, and messaging.

[Mobile Media Japan](#), which is a great source for general news about i-Mode and basically all mobile technology in Japan.

[i-Mode Links](#) which is a good links resource for i-Mode, and they have a good [i-Mode user FAQ](#).

[Mobile Media Japan's i-Mode technical FAQ](#) which is probably the best i-Mode FAQ I've seen so far.

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Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

11.1 What is the Openwave Usability Interface (OUI) ?

You can use the Openwave Usability Interface (OUI) to build a single wireless application that delivers the best possible user experience to a wide variety of Wireless Application Protocol (WAP) devices. The current release of OUI is a developer library implemented in Java, plus tag libraries modeled on the Wireless Markup Language (WML) and XHTML Mobile Profile (XHTML-MP). OUI is released to developers free of charge.

Also see : http://developer.openwave.com/prod_tech/oui.html

[[Main](#)] [[11 - Openwave Usability Interface \(OUI\)](#)]

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13.2 What is a WAP Server?



The Wireless FAQ

13.2 What is a WAP Server?

A WAP Server is nothing more than a normal web server and a [WAP gateway](#)-like device built into one. I personally think the term "WAP server" is very confusing. Many people think that you **must** have a WAP server in order to serve WAP content, but this is **NOT** the case. WAP content is served from any normal web server!

So what is the point of the WAP server? Well, when it comes to [WAP security](#), the WAP server can plug a few holes that are currently unplugged in the WAP environment.

Since the WAP server contains a gateway, the third party gateway usually hosted by the mobile operator can be skipped, and the host of the WAP content will have full control over the encrypted stream.

Note that if you want your users to be able to access your WAP site via your WAP server gateway, they will need to reconfigure their phones, and most of them will have to do it manually.

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[13 - WMLscript in detail](#)]

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10.1 Where can I learn about WMLScript?

This FAQ will as soon as time permits (other things have priority) feature a full WMLScript section. If you want to get the necessary primer and introduction to WMLScript, we recommend the following articles and sites:

For a beginner's guide to WMLScript, see [this](#) article from [ASP Today](#).

[WMLScript.com](#)'s site contains lots of WMLScript info, and even a [WMLScript library](#).

After [registering](#) with [Openwave.com's Developer site](#), you may access their excellent reference to WMLScript at <http://updev.openwave.com/dev/ts/beta/docs/wmlscript/>

Doc JavaScript (and don't let that fool you) has a [couple of articles](#).

Related information

Chapter 6 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[10 - WMLscript in detail](#)]

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The Wireless FAQ

4.2 What's with the HTTP server MIME types?

When you access a "web page" using a PC based browser, the "web server" tells your PC browser what kind of document it should expect. This is done by using something called MIME-types. The common MIME type for a plain HTML document is "text/html". However, for a WAP micro browser, which cannot read HTML, the MIME type has to be different.

The MIME types for serving WML contents are:

<u>Document type</u>	<u>MIME type</u>	<u>Typical extension</u>
Plain WML documents	text/vnd.wap.wml	.wml
Wireless Bitmap Images	image/vnd.wap.wbmp	.wbmp
Compiled WML documents	application/vnd.wap.wmlc	.wmlc
WMLScripts	text/vnd.wap.wmlscript	.wmls
Compiled WML Scripts	application/vnd.wap.wmlscriptc	.wmlsc

To add the above MIME types to the [Apache](#) HTTP server, here's what you do:

- Edit the *srm.conf* file (usually in /etc/httpd/conf)
- Locate the AddType section, and add the following section to the file:

```
# MIME Types for WAP
AddType text/vnd.wap.wml .wml
AddType image/vnd.wap.wbmp .wbmp
AddType application/vnd.wap.wmlc .wmlc
AddType text/vnd.wap.wmlscript .wmls
AddType application/vnd.wap.wmlscriptc .wmlsc
```

- Save the file and restart the Apache HTTPd.

If you do not have control over your Apache server, for instance if you are with an ISP, it is also possible to add a file called **.htaccess** to each directory where you have placed WML files. When the server reads files from this directory, it will serve them according to the rules in the **.htaccess** file.

A typical **.htaccess** file will look something like this:

```
DirectoryIndex index.wml
addtype text/vnd.wap.wml wml
addtype application/vnd.wap.wmlc wmlc
addtype text/vnd.wap.wmlscript wmls
addtype application/vnd.wap.wmlscriptc wmlsc
addtype image/vnd.wap.wbmp wbmp
```

Note the first line which tells the server that the index file for this directory is called **index.wml**. Also note that the server must be configured to read these files. In some cases the server is configured to ignore these files for security reasons. Check with your ISP.

To add the MIME types to a Microsoft IIS server, you need to do the following:

- On the server console, open the *Management console*
- From here you can define the MIME types to either be valid for the entire server or to be valid for separate directories.
- To add a MIME type to a directory: Right click on the directory in which you want to add the MIME type.
- Select the *HTTP headers* tag.
- Click the *File types* button at the lower right.
- Click *New type* and supply the extension and the content type as listed above.
- To add a mime type to an entire server; Right click on the server.
- Click the *File types* button and follow the instructions above.

4.2 What's with the HTTP server MIME types?

- Click *New type* and supply the extension and the content type as listed above.

For other servers, see the server documentation.

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The Wireless FAQ

11 - Openwave Usability Interface (OUI)

Start testing and developing with the Openwave Usability Interface.

[11.1 What is the Openwave Usability Interface \(OUI\) ?](#)

[11.2 Where can I download OUI from?](#)

[11.3 Which development platforms does OUI support?](#)

[11.4 where can I find more information \(mailing lists, support\) about OUI?](#)

[11.5 How do I get started with OUI in the shortest possible time?](#)

[11.6 Which application servers are supported?](#)

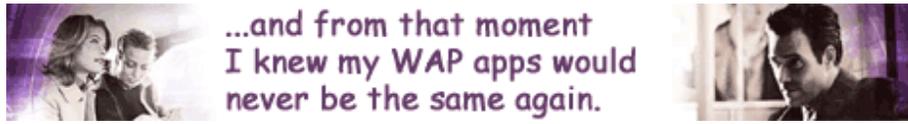
[11.7 Should I program using the Java API, the WML taglib or the XHTML taglib?](#)

[11.8 What's the difference between core-level optimization and application-level optimization?](#)

[11.9 Can I run OUI on Windows 98?](#)

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The Wireless FAQ

02 - Wireless development resources on the web

Links to wireless developer sites, articles and libraries.

[2.1 Where can I find more info on wireless technologies?](#)

[2.2 What Open Source resources are available for the wireless environment?](#)

[2.3 Is there an updated list of Agent strings somewhere?](#)

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2.1 Where can I find more info on wireless technologies?



The Wireless FAQ

2.1 Where can I find more info on wireless technologies?

Here are some links to good wireless resources on the web. Feel free to mail the [FAQ Maintainer](#) to have others added.

Developers Sites

[WapForum](#) - The authoritative source on WAP environment specifications

[Waplinks.com's Developer resources, WML, WMLScript, ASP and PHP code examples](#)

[WMLScript.com](#) - Very promising site for WML and WML Developers

[Wapulous.com](#) - WAP Developer Repository. Long list of user submitted WAP developer links

[Wuzap.org](#) - North American Community Resource for Wireless Application Developers - Absolutely EXCELLENT!

[Wireless Developer Network](#) - Very good collection of resources and information

(Also check Manufacturer Sites)

Articles

[Luca Passani's WAP and ASP articles](#)

[Luca Passani's WML/XML/ASP articles](#)

[Wei Meng Lee's Article on ASP based WAP shopping carts](#)

Books

The current WAP "bible" - [Professional WAP](#) from Wrox

Mailing lists

The Yahoo (prev eGroups.com) [WML and WMLScript Programmers List](#)

[The WMLScript Discussion Forum](#)

[WAPWarp's WAP-Dev mailing list](#) at yoyo.org

Manufacturer Sites

[Nokia's WAP Developer Forum](#)

[Ericsson's mobilityworld](#)

[Openwave Developer's Program](#)

Misc Sites

[WapRing](#) (Excellent catalogue of WAP services for both users and developers)

[PPT WAP Resource center](#) (Lots of info and links)

[dmoz' Mobile Computing:Wireless Data:WAP links](#)

[The WML and WMLScript Programmers List Links Vault](#)

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2.2 What Open Source resources are available for the wireless environment?

Here are some excellent open source sites that in some way relates to WAP and the wireless environment.

- OpenWAP.org, promoting open source WAP development and informing the WAP community of news.
- Kannel.org, an open source WAP Gateway project (*previously wapgateway.org*)
- WMLbrowser.org open source project maintained by 5NINE to create a WML browser that runs in all Linux environments.
- LEAP (Lightweight & Efficient Application Protocols), an open wireless protocol suite specification
- Silocon Penquin Embedded Linux Authority

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2.3 Is there an updated list of Agent strings somewhere?



The Wireless FAQ

2.3 Is there an updated list of Agent strings somewhere?

The method of detecting what kind of browser you are serving described in this FAQ under [section 4.6](#) needs a large list of Agent string, and this is obviously not an ideal solution. Further, you might want to have special functionality for browsers with special capabilities. Such a list will help you detect which browser is being used.

The FAQ maintainers will attempt to keep an updated list of Agent strings available on this server, and if you see an Agent string missing from the file, please let [us](#) know and I will add it to the file.

The User Agent ID String file is available [here](#)

Again, please let us know if there are any errors or anything missing from the table.

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Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

4.6 How can I tell HTML browsers from WML browsers?

Since it's very practical to re-use already existing code that you have written for HTML browsers, you need a way to tell HTML browsers from WML browsers. Also, you might want to redirect HTML browsers to a directory with HTML documents, and WML browsers to WML decks. The PHP code below does just this. The reason the script is written to work this way is that it's easier to understand the code.

The popular [Apache](#) web server has a module called `mod_rewrite` which can also be used for this purpose. See [Philip J. Mikal's mod_rewrite example](#) available at his site.

This has to be done on the server side, and the following PHP code will look first attempt to discover if the WAP gateway being used can accept the `text/vnd.wap.wml` MIME type. If not, it will check the first four characters in the ID string to determine if it's a WML browser. If there's no match, it's assumed that it's an HTML browser. As new WML browsers come along, their ID strings should be added to the list.

The code is based on Robert Whiting's (robert@wapsight.com) code submitted to the PHP mailing list, with several additions for browser ID string from Don Amaro's (donamaro.concepcion@nl.unisys.com) log files :-)

Note that the strings below are only the four first characters of the ID strings. The whole string is for instance "WapIDE-SDK/2.0;(R320s(Arial))" for the Ericsson WapIDE 2.0. Basically, we're just after enough to make it unambiguous.

```
<?
// Because this script sends out HTTP header information, the first characters in
the file must be the <? PHP tag.

$htmlredirect = "/html/my_htmlpage.asp"; // relative URL
to your HTML file
$wmlredirect = "http://wap.mysite.com/wml/my_wmldeck.wml"; // ABSOLUTE URL
to your WML file

if(strpos(strtoupper($HTTP_ACCEPT),"VND.WAP.WML") > 0) { // Check whether
the browser/gateway says it accepts WML.
    $br = "WML";
}
else {
    $browser=substr(trim($HTTP_USER_AGENT),0,4);
    if($browser=="Noki" || // Nokia phones and emulators
        $browser=="Eric" || // Ericsson WAP phones and emulators
        $browser=="WapI" || // Ericsson WapIDE 2.0
        $browser=="MC21" || // Ericsson MC218
        $browser=="AUR " || // Ericsson R320
        $browser=="R380" || // Ericsson R380
        $browser=="UP.B" || // UP.Browser
        $browser=="WinW" || // WinWAP browser
        $browser=="UPG1" || // UP.SDK 4.0
        $browser=="upsi" || // another kind of UP.Browser ??
        $browser=="QWAP" || // unknown QWAPPER browser
        $browser=="Jigs" || // unknown JigSaw browser
        $browser=="Java" || // unknown Java based browser
        $browser=="Alca" || // unknown Alcatel-BE3 browser (UP
based?)
        $browser=="MITS" || // unknown Mitsubishi browser
        $browser=="MOT-" || // unknown browser (UP based?)
        $browser=="My S" || // unknown Ericsson devkit browser ?
        $browser=="WAPJ" || // Virtual WAPJAG www.wapjag.de
        $browser=="fetc" || // fetchpage.cgi Perl script from
www.wapcab.de
```

4.6 How can I tell HTML browsers from WML browsers?

```
        $browser=="ALAV" || // yet another unknown UP based
browser ?
        $browser=="Wapa") // another unknown browser (Web based
"Wapalyzer"?)
    {
        $br = "WML";
    }
    else {
        $br = "HTML";
    }
}

if($br == "WML") {
    header("302 Moved Temporarily"); // Force the browser to load the WML file
instead
    header("Location: ".$wmlredirect);
    exit;
}
else {
    header("302 Moved Temporarily"); // Force the browser to load the HTML file
instead
    header("Location: ".$htmlredirect);
    exit;
}
?>
```

The same kind of functionality can be done in ASP. [Robin van Emden](#) (rave@dataweb.nl) has done the following script which takes the browser to either "/index.wml" or "/index.asp" depending on what sort of MIME types the browser (or gateway) accepts. Note that the following script is not *identical* in functionality to the script above. Also note that this requires the gateway to tell the web server that it really accepts the **text/vnd.wap.wml** MIME type, while the script above first checks if the browser can accept the MIME type, then checks the identification of the browser.

```
<% Response.Buffer = TRUE
Dim IsWap
httpAccept = LCase(Request.ServerVariables("HTTP_ACCEPT"))
if Instr(httpAccept,"wap") then
IsWap=1
Else Response.Redirect "/index.asp" : Response.Flush : Response.End
End if %><%Response.ContentType = "text/vnd.wap.wml"%><?xml
version="1.0"?><%Response.Flush%>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
    <card id="redirect">
        <onevent type="onenterforward">
            <go href="/index.wml"/>
        </onevent>
    <p>
    <a href="/index.wml">enter</a>
    </p>
    </card>
</wml>
<%Response.Flush:Response.End%>
```

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The Wireless FAQ

2.3 Is there an updated list of Agent strings somewhere?

Agent String	Description	Type
4thpass.com KBrowser 1.0		Other
ALAV UP/4.0.7		Phone
AUR PALM WAPPER		PDA
AUR PALM WAPPER (WAP 1.1)		PDA
Alcatel-BE3/1.0 UP/4.0.6c		Phone
Alcatel-BE3/1.0 UP/4.1.8d		Phone
Alcatel-BE3/1.0 UP/4.1.8h		Phone
Alcatel-BE4/1.0 UP/4.1.16f		Phone
Alcatel-BE4/1.0 UP/4.1.16m		Phone
CE	PocketPC PocketIE	PDA
Conduits-PalmBrowser/1.5	WinCE ConduitsBrowser	PDA
DS12 UP	DensoTouchPoint	Phone
Device V1.12		Unknown
ERK0 UP	Ericsson R280	Phone
Elaine	Palm ElaineBrowser	PDA
Ericsson/R1A		Other
EricssonA2618s/R1A		Phone
EricssonR320/R1A		Phone
EricssonR320/R1A (Fast Wireless Crawler)		Unknown
EricssonT20/R2A		Phone
EzWAPBrowser1.0-WAP		Other
EzWAPBrowserCE1.0-WAP		Other
G1 UP/4	UPEmulator4	Phone
IG01 UP	Neopoint NP1000	Phone
Javal.1.8		Other
Javal.2.2		Other
Klondike/1.0		Other
Klondike/1.1		Other
Klondike/1.12 (HTTP Win)		Other
Klondike/1.13 PPC3		Other
M3GATE [Microsoft Windows 98]/0.5		Other
MC01 UP	Motorola T8167	Phone
MC218 2.0 WAP1.1		Other
MC218 2.0 WAP1.1		Phone
MCCA UP	Motorola ST7867	Phone
MO01 UP	Motorola i700Plus	Phone
MOT-AF/4.1.8 UP/4.1.16s		Phone
MOT-C4/0.0.21 UP/4.0.5m		Phone
MOT-C4/0.0.23 UP/4.0.5o		Phone
MOT-C4/4.1.4 UP/4.1.16a		Phone
MOT-C4/4.1.5 UP/4.1.16f		Phone
MOT-C4/4.1.6 UP/4.1.16g		Phone
MOT-C4/4.1.8 UP/4.1.16s		Phone
MOT-CB	Motorola Timeport	Phone
MOT-CB/0.0.18 UP/4.0.10 UP.Browser/4.0.10-XXXX		Phone
UP.Link/4.1.HTTP-DIRECT		Phone
MOT-CB/0.0.18 UP/4.0.5i		Phone
MOT-CB/0.0.19 UP/4.0.5j		Phone
MOT-CB/0.0.21 UP/4.0.5m		Phone
MOT-CB/4.1.5 UP/4.1.16f		Phone
MOT-CB/4.1.7 UP/4.1.16p		Phone

list of Agent strings

MOT-CF/00.26.31 UP/4.1.16f		Phone
MOT-D3/0.0.22 UP/4.0.5n		Phone
MOT-D5/0.0.23 UP/4.0.5o		Phone
MOT-D8/4.1.8 UP/4.1.16s		Phone
MOT-F0/4.1.8 UP/4.1.16s		Phone
Materna-WAPPreview/1.1.3		Other
Mitsu/1.1.A		Phone
Mitsu/1.1.A		Phone
Mitsu/1.1.A UP.Link/4.2.1.2		Phone
Motorola VoxGateway/2.0		Other
Mozilla/1.0	Palm	Palm GoWeb
Mozilla/1.22 (compatible	MMEF20	Cellphone
Nokia-WAP-Toolkit/1.2		Other
Nokia-WAP-Toolkit/1.3beta		Other
Nokia-WAP-Toolkit/2.0		Other
Nokia6210/1.0 (02.9)		Phone
Nokia6210/1.0 (03.01)		Phone
Nokia6210/1.0 (03.04)		Phone
Nokia6210/1.0 (03.74)		Phone
Nokia6210/1.0 (04.04)		Phone
Nokia6210/1.0 (04.08)		Phone
Nokia6250/1.0 (03.00)		Phone
Nokia6250/1.0 (03.12)		Phone
Nokia7110 (DeckIt/1.0)		Other
Nokia7110/1.0		Unknown
Nokia7110/1.0 ()		Unknown
Nokia7110/1.0 (04.67)	Nokia 7110	Phone
Nokia7110/1.0 (04.67)	Nokia 7110	Phone
Nokia7110/1.0 (04.69)	Nokia 7110	Phone
Nokia7110/1.0 (04.70)	Nokia 7110	Phone
Nokia7110/1.0 (04.71)	Nokia 7110	Phone
Nokia7110/1.0 (04.73)	Nokia 7110	Phone
Nokia7110/1.0 (04.74)	Nokia 7110	Phone
Nokia7110/1.0 (04.76)	Nokia 7110	Phone
Nokia7110/1.0 (04.77)	Nokia 7110	Phone
Nokia7110/1.0 (04.78)		Phone
Nokia7110/1.0 (04.80)	Nokia 7110	Phone
Nokia7110/1.0 (04.84)		Phone
Nokia7110/1.0 (04.88)		Phone
Nokia7110/1.0 (04.88) UP.Link/4.3.1.1		Phone
Nokia7110/1.0 (04.94)		Phone
Nokia7110/1.0 (05.00)		Phone
Nokia7110/1.0 (1.23)		Phone
Nokia7110/1.0 (30.05)		Unknown
Nokia7110/1.0_(01.11)_UP.Link/4.1.0.7:		Phone
Nokia9110/1.0		Phone
PHILIPS-Ozeo UP/4.1.16r		Phone
PHILIPS-V21WAP UP/4.1.16r		Phone
PLM's WapBrowser		Other
Panasonic WAP		Phone
Psion Cpw/1.00f(RV) War/1.00f		PDA
Psion Cpw/1.00f(S5) War/1.00f		PDA
QC12 UP	Qualcomm QCP2700	Phone
QC32 UP	Qualcomm QCP2760	Phone
QWAPPER/1.0		Other
R380 2.0 WAP1.1		Phone
R380 2.0 WAP1.1		Phone
R380 2.0 WAP1.1 UP.Link/4.1.0.6		Unknown
RIM950	Blackberry RIM950 GoWeb	Other
RIM957	Blackberry RIM957 GoWeb	Other
Rover	Blackberry RIM957 Neomar	Other
SC01 UP	Samsung SCH3500	Phone

list of Agent strings

SDK/2.1: (R320	Ericsson R320Emulator	Other
SIE-C3I/1.0 UP/4.1.8c		Phone
SIE-C3I/1.0 UP/4.1.8c UP.Browser/4.1.8c-XXXX UP.Link/4.1.1		Phone
SIE-C3I/2.0 UP/4.1.9		Phone
SIE-C3I/3.0 UP/4.1.16m		Phone
SIE-IC35/1.0		Phone
SIE-P35/1.0 UP/4.1.2a		Phone
SIE-P35/1.0 UP/4.1.2a		Phone
SIE-S35/1.0 UP/4.1.8c		Phone
SIE-S35/1.0 UP/4.1.8c UP.Browser/4.1.8c-XXXX UP.Link/4.1.1		Phone
SIE-S35/3.0 UP/4.1.16m		Phone
SY01 UP	Sanyo SCP4000	Phone
T250 UP	Mitsubishi T250	Phone
UP.Browser/3.01-IG01		Phone
UP.Browser/3.01-QC31		Phone
UP.Browser/3.02-MC01		Phone
UP.Browser/3.02-SY01		Phone
UP.Browser/3.04-DS14 UP.Link/3.2.3.8		Other
UP.Browser/3.1-UPG1		Phone
UP.Browser/4.1.2a-XXXX		Phone
UPG1 UP/4.0.10 UP.Browser/4.0.10-XXXX UP.Link/4.1.HTTP-DIRECT		Other
UPG1 UP/4.0.7		Phone
WAPJAG Virtual WAP		Other
WAPJAG Virtual WAP		Other
WAPPER		Other
WAPman Version 1.1		Other
WAPman Version 1.1 beta:Build W2000020401		Other
WAPman Version 1.6.3:Build W2000071100		Other
WAPman Version 1.7.1:Build W2000092200		Other
WAPman Version 1.7.2:Build W2000112400		Other
WapIDE-SDK/2.0; (R320s (Arial))		Other
WapIDE-SDK/2.1; (R320s (Arial))		Other
WapView 0.00		Other
WapView 0.20371		Other
WapView 0.28		Other
WapView 0.37		Other
WapView 0.46		Other
WapView 0.47		Other
Wapalizer/1.0		Other
Wapalizer/1.1		Other
Wapalizer/1.2		Other
Wapalizer/1.2 - Siemens c35i		Other
Wapalizer/1.2 - Siemens s35i		Other
Wapalizer/1.2 - unbranded		Other
Waptor 1.0		Other
WinCE	WinCE iBrowser	PDA
WinWAP 2.2 WML 1.1		Other
WinWAP 2.3 Light		Other
WinWAP 2.3 PRO		Other
WinWAP 3.0 PRO 3.1-UPG1 UP	UPEmulator32	Phone
YOURWAP.com Wireless Companion		Other
YourWap/0.91		Other
YourWap/1.16		Other
Zetor		Other
ccWAP-Browser		Other
fetchpage.cgi/0.53		Other
iBrowser/1.1	WinCE iBrowse	PDA
libwww-perl/5.47		Other
m-crawler/1.0 WAP		Other
m-crawler/2.3 WAP (m-crawler@m-central.com; http://m-central.com)		Other
wmlb		Other

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The Wireless FAQ

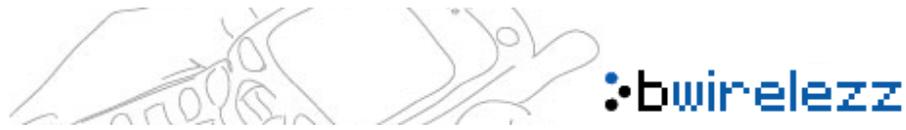
03 - Accessing WML contents

How to access already existing WAP sites. WAP browsers for most operating systems. WAP gateways and WAP operator environments.

- [3.1 How do I access WML pages?](#)
- [3.2 How do I bypass my operator and connect "directly" to the internet?](#)
- [3.3 Can I "surf" WAP sites without using a real WAP device?](#)
- [3.4 I'd like to set up my own WAP operator service, what do I do?](#)
- [3.5 Is there a list of available WAP phones and WAP devices on the market?](#)
- [3.6 Where can I find publicly available WAP gateways on the internet?](#)
- [3.7 Where and how do I register a WAP domain?](#)

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3.1 How do I access WML pages?

The easiest way to access WML pages, or cards, is to go through an existing gateway. Most cellular providers will have this functionality on their WAP home page which you access through the WAP device. The gateway link is commonly called "Go to URL". When selected, the WAP device will access the URL you specify through normal IP via the gateway. In this case, it is the gateway that reads the WML contents for you and passes it on to your WAP device. The contents are ready the same way a PC based browser reads them.

Some operators have chosen not to allow their users access to other sites than their own. This could be compared to an Internet Service Provider only allowing its users access to the ISP's own sites. Such a policy shows a clear lack of brains, and any such operator will find that customers will go elsewhere.

If you're stuck with such an operator, it is possible to get around this by connecting to the internet via a local ISP's dial up service and use a public gateway to access WAP resources. An e-mail explaining the error to the operator in question could probably also help.

Related information

Chapter 2 in "[Professional WAP](#)" from Wrox

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3.2 How do I bypass my operator and connect "directly" to the internet?

If you are stuck with an operator that will not allow you to access other WAP resources than the ones they decide, or if you simply want to bypass your operator for development purposes, most WAP devices will let you do this.

Since different WAP devices work in different ways, this is a very general example, but you should be able to figure it out.

First of all you need the telephone number of a local Internet Service Provider with which you have a normal dial up account (the same type of account you'd use for your home computer for instance). Either one you pay for, or something you get for free. Many ISPs actually offer dial up access to the internet for free. The ISP doesn't *have* to be local, but remember that you're going to pay mobile call prices for this. The ISP needs to support the PPP protocol. Obviously, you also need a userid and password with this ISP. Then you need the IP address of a public gateway.

Some public gateways:

Provider	IP Address	Gateway type
Ericsson	195.58.110.201	Ericsson
wapHQ	212.1.130.132	wapHQ Gateway

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There is also a list of other gateways [here](#).

Configure your WAP device with the telephone number, userid, password and IP address for the gateway. On the [Nokia 7110](#) this is done under *Services, Settings, Connection Settings*. The [Nokia 7110](#) uses a Bearer Type of SMS as default, and you need to change this to *Data*. There is also settings for *Data Call Type* and *Connection Types*. For the *Data Call Type* you should probably select *ISDN*, but you have to experiment with what works with your ISP. For the *Connection Type* you should probably choose *Temporary*, but again you need to experiment.

Finally set the *Home Page* to some WAP service on the internet you know works, and you're ready to go.

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3.3 Can I "surf" WAP sites without using a real WAP device?

Yes, WML contents can be read by any micro browser or User Agent. The best way of reading WML content would probably be to use one of the many WAP device emulators available, because the contents are written for real WAP devices, but these are heavy applications and some of the require installation of additional components such as Java Runtime.

Here's a list of some browsers, emulators and related things. Note that they are in no particular order.

Browser name	Environment	Description
WAPJAG.DE	Internet Explorer	Web based browser. Good for surfing.
Yospace	Windows/MacOS/Solaris/UNIX/Linux	SmartPhone Emulator
AU Systems WAP Browser	PalmOS 3.3	An alternative to a WAP phone for instance.
WinWAP	Windows9x/NT	Simple browser. Good for application testing during development.
Wapalizer	Internet Explorer/Netscape	Simple browser. Good for application testing during development.
Fetchpage	Any HTML browser	Not really a browser, but useful for developers. Displays HTTP header info.
WAPman	Windows9x/NT	Pretty looking browser. Even has skins!
WAPman	PalmOS 3.1	Pretty looking browser. Same as above, but for the PalmOS 3.1 operating system
Nokia WAP Toolkit 1.3 Beta	Windows9x/NT+Java	Preferred developers kit of many developers. You MUST register first!
Nokia WAP Toolkit 1.2	Windows9x/NT+Java	Preferred developers kit of many developers. You MUST register first!
Openwave.com UP.SDK	Windows 9x/NT	UP.Browser SDK (4.0 and 3.2)
Ericsson R380 Emulator	Windows NT 4.0	Ericsson's R380 Emulator.
Nokia SDK 2.18	Windows9x/NT	Good development kit and a good 7110 emulator. Again the preferred choice of many developers.
Wappy's Wapview	Internet Explorer/Netscape	Simple browser based WML viewer
Opera 4.0	Standalone kick-ass browser	The Norwegians do it again. This is a kick-ass HTML browser, now with WML support
EzWAP	Windows NT, 2000, CE and Pocket PC	Nice looking "multi"-platform browser. Only \$25 USD. Demo available.

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3.4 I'd like to set up my own WAP operator service, what do I do?



The Wireless FAQ

3.4 I'd like to set up my own WAP operator service, what do I do?

If you are unhappy with the type of access you get from your mobile operator, if you want to give your company's users access to intranet WAP services, if you want a separate system to develop your WAP services on, or if you just want to play around, setting up your own WAP device dialup service is quite simple.

There are many solutions available on the market, from the high-end boxed Cisco Access Servers (AS5200), to the low-end and much cheaper software based solutions from Microsoft, NT Remote Access Service, and Novell's Netware Connect.

It would take a lot of work explaining how to configure all these different systems in this FAQ, and after all this is not really related to WAP. A WAP device after all gets IP just like your home computer via the Point-to-Point Protocol (PPP).

Chances are that you already have access to a machine with Microsoft NT 4.0 and some kind of analogue modem capable of 9600 bits/second or more, so for a very simple and straight forward explanation of how to set it up, have a look at [Fergal Moran's](#) (fergal.moran@wasptech.com) "[Configuring your NT server to accept remote connections](#)"

You should have no problems setting it up on other systems either. Just remember that if you can dial in with say the Windows98 Dialup-Networking, you can almost certainly dial in with a WAP device as well.

This takes care of the WAP devices' access to IP. Now you need to set up your own internal WAP gateway and a HTTP server, or you could just use any publicly available WAP gateway and HTTP server.

Related information

Chapter 2 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[03 - Accessing WML contents](#)]

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3.5 Is there a list of available WAP phones and WAP devices on the market?



The Wireless FAQ

3.5 Is there a list of available WAP phones and WAP devices on the market?

If you know of a WAP phone or WAP device that is not in this list, please let [me](#) know. The list is in no particular order. Phones are, as far as I know, GSM unless otherwise stated. Openwave.com also has an excellent list of released (and unreleased) devices with their browsers [here](#).

AnyWhereYouGo also has an excellent table of most WAP enabled [phones](#) and [PDAs](#). These tables even show technical information about each device such as browser type, markup languages supported, screen size and network bearer type.

There is also a list of released devices at WAPWala.net.

Most of the information below comes directly from the manufacturer. Manufacturers not listed below, can most likely not be bothered to tell developers that they've released a new device.

Alcatel One Touch View db WAP	Phone
Alcatel One Touch 30x Series	Phone
Alcatel One Touch 50x Series	Phone
Alcatel One Touch 70x Series	Phone
Alcatel Onetouch View	Phone
Siemens S35i	Phone
Siemens M35i	Phone
Siemens C35i	Phone
Siemens S25	Phone
Nokia 7110	Phone
Sony CMD-Z5	Phone
Nokia 6210	Phone
Nokia 6250	Phone
Nokia 6185	Phone
Motorola Leap P7389	Phone
Motorola Timeport	Phone
Motorola Talkabout	Phone
Motorola i1000plus	Phone
Motorola i500plus	Phone
Ericsson MC218	Palmtop
Ericsson R380	Phone
Ericsson R320	Phone
3Com Palm Pilot	Palmtop
Neopoint 1000	Phone
Neopoint 1600	Phone

3.5 Is there a list of available WAP phones and WAP devices on the market?

[Sagem MC850](#)

Phone

[Samsung Duette SH-P10](#)

Phone

[Samsung SGH-800](#)

Phone

[Mitsubishi T250](#)

Phone

[Compaq Aero](#)

PDA

[Qualcomm QCP-860](#)

Phone

[Qualcomm QCP-1960](#)

Phone

[Qualcomm QCP-2700](#)

Phone

[Qualcomm QCP-2760](#)

Phone

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3.6 Where can I find publicly available WAP gateways on the internet?

In many cases you would want to test your applications with several types of gateways, just because they work in different ways. You might also want to connect to another gateway than the one your operator provides for some reason or other.

[WAPdrive.net](http://www.wapdrive.net) has a very good list of public gateways available at http://www.wapdrive.net/DOCS/wap_gateways.asp. **Note** that the list includes gateways that are **not** publicly available. If the IP address starts with "10.", then the gateway is private and only reachable through the operator/owner. Gateways with IP addresses in another range does not guarantee public availability. *(Also note that the site was very slow when I tested it)*

How to change your gateway setting should be explained in your WAP device's user manual, or you can have a look [here](#).

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Authoring for Multiple WAP devices
Absolutly NOT.... OUI

The Wireless FAQ

3.7 Where and how do I register a WAP domain?

There is **no** difference between a "web" domain and a WAP domain. If you already have a web site, then you also have an Internet Provider who have hooked your site to the internet.

The common host names for "web" sites is **www** or **www.mydomain.com**, and the typical host name for a WAP site is **wap.mydomain.com**.

When a domain is registered either via your Internet Provider or directly to one of the domain registration companies like [Network Solutions](#), you register the domain part, i.e. **mydomain.com**. A so called Domain Name Server (DNS) is then assigned to hold a list of names and addresses for the hosts that live in this domain. The DNS simply translates textual human readable host names into IP addresses, and IP addresses into human readable host names. If you have a "web" site, you will have at least one host in this list called **www** which points to an IP address. When someone attempts to access you site, the DNS for the domain is asked "What is the IP address of the host called **www.mydomain.com**?" and the DNS replies with the IP address, for instance "193.143.2.90", which the requester then uses to access the site.

To add a WAP host to your domain, you basically just need to add a host in the DNS for the domain can call this host **wap**. Any user requesting the IP address of **wap.mydomain.com** will now receive the IP address of this WAP host.

The WAP host and the "web" host can have the same IP address, which in effect means that you serve both "web" and WAP content from the same web server. Since "web" browsers read HTML and WAP browsers read WML, your web server needs to be able to tell which type of browser it is talking to, and that can be done with a simple script on the server. This is explained [here](#). Since both the **www.mydomain.com** and the **wap.mydomain.com** host names both point to the same IP address, the WAP users can access **www.mydomain.com** and the "web" users can **wap.mydomain.com**. After all, the textual host name is just a human readable representation of the IP address of the host.

If you have one server for "web" content, and another for WAP content, you obviously need to point the "web" hostname (www.mydomain.com) to the IP address of the web server hosting the "web" contents, and the WAP hostname (wap.mydomain.com) to the web server hosting the WAP contents.

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The Wireless FAQ

04 - Serving WML contents

Re-using the code and technology from the wired web in the wireless environment. PHP, ASP, Perl, Java Servlets, etc.

- [4.1 What do I need to serve WML contents to a WAP device?](#)
- [4.2 What's with the HTTP server MIME types?](#)
- [4.3 How can I use PHP to make WML contents more dynamic?](#)
- [4.4 Can you show me some examples serving WAP via PHP?](#)
- [4.5 How do I prevent a WML deck from being read from the cache?](#)
- [4.6 How can I tell HTML browsers from WML browsers?](#)
- [4.7 How do I read data from the WAP device \(telephone number etc\)?](#)
- [4.8 Why is the HTTP User Agent string different with the Openwave.com gateway?](#)
- [4.9 Is it possible to localize text in the browser?](#)
- [4.10 How do I prevent variables from being stored in the cache?](#)
- [4.11 How do I access a database from WML?](#)
- [4.12 How can I control caching when nothing else works?](#)
- [4.13 How can I use ASP to make WML contents more dynamic?](#)
- [4.14 How do I pass a variable from WML to ASP?](#)
- [4.15 Is there a list of other useful stuff for serving WML contents?](#)
- [4.16 How do I use XSL with WML and WAP?](#)
- [4.17 How can I use Perl to make WML contents more dynamic?](#)
- [4.18 What is PUSHing and how does it work?](#)

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4.1 What do I need to serve WML contents to a WAP device?



The Wireless FAQ

4.1 What do I need to serve WML contents to a WAP device?

The easiest way to serve WML contents is to use any good HTTP server, like [Apache](#). If you want dynamic contents, you can use a server side script language called [PHP](#). Both are of course written to serve HTTP compatible, HTML browsers, but work fairly good for WAP compatible WML micro browsers too.

Unless you link your WAP site with the portal of a mobile phone network provider, users have to type in the URL to your site on their phone which can be a complicated task. As "www" has become the standard hostname for HTTP server, "wap" seems to be the standard when it comes to servers containing WAP applications. Ie. "wap.domain.com".

One very important thing is that you remember to tell the HTTP server to tell the WML browser that it is receiving WML pages, and not HTML pages. This is done by using MIME.

Related information

Chapter 2 in "[Professional WAP](#)" from Wrox

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4.3 How can I use PHP to make WML contents more dynamic?

[PHP](#) (and most other server side script languages) can be used to make your WML contents dynamic in that they can do all the work and squeeze the output into the narrow format that the WML micro browser in your WAP device accepts. Check the [PHP web site](#) for more info on PHP.

Note that some built-in features of PHP outputs HTML, typically error messages, which your WML micro browser will not understand.

PHP is so flexible that one HTML document containing a PHP script can be used for both HTML and WML compatible browsers. The PHP source code is invisible to the client, and it's simply up to you to either output HTML code when the browser is a HTML compatible browser, and WML code when the browser is a WML compatible browser.

A PC based browser can be used during development of the PHP WML code by adding this PHP code to the very top of your page:

```
<?
// header("Content-type: text/vnd.wap.wml");
echo("<?xml version=\"1.0\"?>\n");
echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
?>
```

The PC based browser will ignore any WML tags it doesn't understand. Then, when you are ready to try the code on your WAP device or WAP device emulator, you simply remove the two slashes (//) in front of the "header" command (uncommenting it), and the page automatically becomes a WML deck.

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Fast, Good and Free ...~~Pick Two ;)~~

Pick Three!!! OUI

The Wireless FAQ

4.4 Can you show me some examples serving WAP via PHP?

This example produces a very useful application called PizzaCalc. It inputs the total cost of your pizza bill and the number of people who've had pizza, and then produces the cost per person.

The application produces a deck with one dynamic card, either called "calc" or "input" based on the action. Notice all the escaped characters such as the double quotes. It also shows simple variable handling, and how to pass variables from one card to another.

With a WML browser, you can [try the application here](http://wap.colorline.no/wap-faq/apps/pizzacalc.asp) (http://wap.colorline.no/wap-faq/apps/pizzacalc.asp) or you can simply go to the much-easier-to-type URL of <http://www.thewirelessfaq.com/demos.asp> and choose the application from there.

```
<?
  header("Content-type: text/vnd.wap.wml");
  echo("<?xml version=\"1.0\"?>\n");
  echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
  \"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
  echo("<!-- The application PizzaCalc was originally made by The Crusaders
  www.crusaders.no on the Commodore Amiga -->\n");
  echo("<!-- It was unfortunately not possible to emulate the crap interger handling
  of the original program -->\n");
?>

<wml>

<?
  if($action == "calc") {
    echo("<card id=\"result\" title=\"PizzaCalc\">\n");
    echo("<do type=\"prev\" label=\"Back\">\n");
    echo("<go href=\"pizzacalc.asp#input\"/>\n");
    echo("</do>\n");
    echo("<p>\n");
    echo("The cost per eater will be ".$total / $eaters."<br/>\n");
  }
  else {
    echo("<card id=\"input\" title=\"PizzaCalc\">\n");
    echo("<p>\n");
    echo("<anchor>Split Pizza bill <go
href=\"pizzacalc.asp?total=\$(total)&eaters=\$(eaters)&action=calc\"/></anchor>\n");
    echo("<br/>\n");
    echo("Total cost: <input type=\"text\" name=\"total\" format=\"%N\"/>\n");
    echo("Eaters: <input type=\"text\" name=\"eaters\" format=\"%N\"/>\n");
  }
?>

</p>
</card>
</wml>
```

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The Wireless FAQ

4.5 How do I prevent a WML deck from being read from the cache?

You might want to check [this](#) section if you have problems controlling cache the way it's described below.

After a WML deck has been downloaded to the WAP device, it lives in the WAP device's memory for a certain period of time. Until this period has expired, the deck will not be downloaded from the server but instead from the WAP device memory. This is known as caching, and it obviously speeds things up considerably.

However, in some rare cases you might not want the deck to be read from the cache memory but from the server. A typical case is where you have a deck containing cards with information that gets updated frequently. By adding some cache information to the HTTP header you send out from the server, you can tell the WAP device that the following deck should never be stored in the cache.

Note that this requires that you are able to produce HTTP headers on the server side, either using PHP, ASP, Perl or some other type of server side scripting language. The lines cannot be included in the deck code as they are HTTP header information, not WML elements.

IMPORTANT! For **static** decks, or if you do not have access to a server side script language, many browsers support META tags that control caching on the browser. See the end of this section for examples on using META tags for controlling the cache.

See the [W3C HTTP specifications](#) for more details on HTTP.

With the following lines added to the HTTP header, the deck will expire immediately:

```
Expires: Mon, 26 Jul 1997 05:00:00 GMT
Last-Modified: DD. month YYYY HH:MM:SS GMT
Cache-Control: no-cache, must-revalidate
Pragma: no-cache
```

The first line tells the micro browser that the deck should expire some time in the past. The second line tells the browser when the deck was last modified, and "DD" should be replaced by the current day-of-the-month (eg. "28"), "month" with the current month (eg. "January"), "YYYY" with the current year (eg. "1999"), "HH:MM:SS" with the current time (eg. (08:19:23)). The third and the fourth line have the same effect, i.e. to tell the browser that the deck should not be cached - line three is HTTP 1.1 and line four is HTTP 1.0.

The following PHP example produces the above header each time the deck is accessed.

```
<?
  header("Content-type: text/vnd.wap.wml"); // set the
correct MIME type
  header("Expires: Mon, 26 Jul 1997 05:00:00 GMT"); // expires in
the past
  header("Last-Modified: " . gmdate("D, d M Y H:i:s") . " GMT"); // Last
modified, right now
  header("Cache-Control: no-cache, must-revalidate"); // Prevent caching,
HTTP/1.1
  header("Pragma: no-cache"); // Prevent caching,
HTTP/1.0
?>
```

Here's an example using WebClasses in VB, using "-1" as a value for Response.Expires to prevent caching.

```
Private Sub WebClass_Start()
  'Set correct MIME type
  Response.ContentType = "text/vnd.wap.wml"

  'Make sure no caching
  Response.Expires = -1
  Response.AddHeader "Pragma", "no-cache"
```

4.5 How do I prevent a WML deck from being read from the cache?

```
Response.AddHeader "Cache-Control", "no-cache, must-revalidate"

'Use basicwml(my own) as template
Set NextItem = basicwml
End Sub
```

And here's an example in ASP, again using "-1" as a value for Response.Expires to prevent caching.

```
<%
Response.ContentType = "text/vnd.wap.wml"
Response.Expires = -1
Response.AddHeader "Pragma", "no-cache"
Response.AddHeader "Cache-Control", "no-cache, must-revalidate"
%>
```

And finally a couple of examples on controlling the caching of **static** decks using META tags:

The following deck will **always** be loaded off the server. Note that you should never use this unless you know what you're doing since it eats bandwidth and "wastes" time, every time the deck is requested.

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
  <head>
    <meta forua="true" http-equiv="Cache-Control" content="max-age=0"/>
  </head>
  <card id="alwaysexpire">
    <p>This deck will never be stored in the cache</p>
  </card>
</wml>
```

The following deck will be loaded instantly from the browser's cache memory instead of from the server until 86400 seconds (24 hours) have passed.

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
  <head>
    <meta forua="true" http-equiv="Cache-Control" content="max-age=86400"/>
  </head>
  <card id="expirelday">
    <p>This card will live in the cache for a day</p>
  </card>
</wml>
```

Some browsers such as the UP.Browser will not reload a deck if it is reached by going "back" from another card. (The object of the cache is to **save** bandwidth and time). To force this behaviour, you must use the **must-revalidate** parameter to the META tag.

```
<meta forua="true" http-equiv="Cache-Control" content="must-revalidate"/>
```

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4.7 How do I read data from the WAP device (telephone number etc)?

There is some information available through HTTP, but it is limited. Things like the telephone number of a WAP cell phone will most likely be unavailable due to the fact that only a few WAP gateways pass this information on. Also there are regulations regarding privacy in some countries that make this illegal.

Basically what you are left with is whatever the WAP gateway is set up to pass along to the HTTP server. This varies from WAP gateway to WAP gateway. Openwave.com's UP.link gateway is the best in this case, because it returns a string in the HTTP header called **UP_X_SUBNO** which contains the subscriber number. The Ericsson gateway pass along a string that is unique to each device, but it does not contain the subscriber number in clear text.

The information is passed from the WAP gateway to the HTTP server each time the WAP device requests a URL from the HTTP server.

The following PHP script will display all the HTTP header information passed on by the gateway. With a WML browser, you can [try the application here](#). (<http://allnetdevices.com/faqclientinfo.asp>). Like all example applications in this FAQ, this one is also available at the much more easy-to-type URL of <http://www.thewirelessfaq.com/demos.asp>

The first part gets all the standard HTTP header info. For more detail on those, check the [W3C HTTP specifications](#). The second part pulls out some other header stuff that is mostly there for the sake of the example.

```
<?
  header("Content-type: text/vnd.wap.wml");
  echo("<?xml version=\"1.0\"?>\n");
  echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
  echo("<!-- Code written in Microsoft NOTEPAD.EXE -->\n");
?>

<wml>
  <card id="init" title="Client Info">
    <p>
      <?
        // First part - standard HTTP stuff
        $headers = getallheaders();
        while (list($header, $value) = each($headers)) {
          echo strtoupper($header).": ". $value."<br/>\n";
        }
        // Second part
        echo("REMOTE_ADDR: ".$REMOTE_ADDR."<br/>\n");           // IP address of
the client side
        echo("REMOTE_PORT: ".$REMOTE_PORT."<br/>\n");           // Port at the
client side
        echo("REMOTE_USER: ".$REMOTE_USER."<br/>\n");           // Name of
authenticated user
        echo("GATEWAY_INTERFACE: ".$GATEWAY_INTERFACE."<br/>\n"); // Gateway
Interface type
        echo("SERVER_PROTOCOL: ".$SERVER_PROTOCOL."<br/>\n");   // Protocol used
by the server
        echo("REQUEST_METHOD: ".$REQUEST_METHOD."<br/>\n");     // Request Method
        echo("HTTP_CONNECTION: ".$HTTP_CONNECTION."<br/>\n");   // Connection
type
        echo("HTTP_VIA: ".$HTTP_VIA."<br/>\n");                 // Host it
connected via (proxy)
      ?>
    </p>
  </card>
</wml>
```

4.7 How do I read data from the WAP device (telephone number etc)?

```
</card>  
</wml>
```

Also, [Henrik Gemal](mailto:gemal@dk.net) (gemal@dk.net) has an online WML based tool for displaying even more information from the HTTP headers, the server environment and your browser. The tool, called BrowserSpy, is available for WML browsers at <http://wap.gemal.dk/>

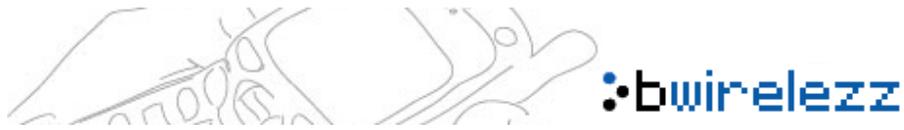
[Werner Forkel](#) has submitted a Perl script that displays the subscriber number (if found). The script can be tested at <http://allnetdevices.com/faq/apps/subnotest.wml>, and is also available from the WAP Demo section at <http://www.thewirelessfaq.com/demos.asp>.

Note that the only WAP Gateway that uses the **UP_X_SUBNO** header is UP.Link. If you are testing the script via another brand of gateway, the subscriber number will not appear. However, this gateway is widely used in the US. For this reason, the subscriber number cannot be used as a unique identifier, at least not on a global basis. Not everyone in the world are using UP.Link gateways.

Both the WML and the Perl script are downloadable [here](#).

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4.8 Why is the HTTP User Agent string different with the Openwave.com gateway?

If you're looking at the HTTP header that is sent to your HTTP server from [Openwave.com's UP.Link gateway](#), you will notice a difference in the User Agent field. The UP.Link gateway very cunningly adds the name and version number of the gateway. Good work Openwave.com! This is the sort of stuff we like! If only other gateway developers could do the same..

If your user is passing through a Nokia or Ericsson gateway, the User Agent will look something like this:

```
EricssonR320/R1A
```

But, if he's passing through the UP.Link gateway, the same user will look like this:

```
EricssonR320/R1A UP.Link/4.1.0.1
```

Which clearly identifies the gateway **UP.Link** and the version number **4.1.0.1**. Great stuff for when you want to add extra functionality for those users who are coming in via that type of gateway. Several of the other popular gateways are now also identifying themselves via the **HTTP_VIA** header.

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4.9 Is it possible to localize text in the browser?

As with any good HTML browser, it is possible to read what language the WAP device is configured for, depending on whether it includes this in the HTTP headers it sends to the web server. Most devices do, so this variable can be read and text can be localized based on this.

The HTTP header is called **Accept-Language** and contains one or more language identifiers separated by a comma. Each identifier is a two character code, based on ISO-639, for instance **en** for English, **no** for Norwegian and so on. For the full description of the **Accept-Language** header, see the [HTTP 1.1 Reference, section 14.4](#). For a complete list of language codes, see this [ISO-639](#) document.

The following bit of [PHP](#) code shows the way to read the **Accept-Language** header and select the language. The code should be easy enough to convert to other script languages. The basic concept is to read the two first characters from the **Accept-Language** header and simply choose the language based on that.

```
<wml>
  <card id="loc" title="Localized Text">
    <p>
      <?
        switch(substr($_HTTP_ACCEPT_LANGUAGE,0,2)) {
          case "en":
            echo("Your WAP device is configured for English language");
            break;
          case "no":
            echo("Din WAP-dings er konfigurert for Norsk språk");
            break;
          case "sv":
            echo("Din WAP-sak är konfigurerad för Svensk språk");
            break;
          default:
            echo("I have no idea what language your WAP device is using..");
        }
      ?>
    </p>
  </card>
</wml>
```

This and most other code examples in this FAQ is available as demo applications at <http://www.thewirelessfaq.com/demos.asp>

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4.10 How do I prevent variables from being stored in the cache?

Variables are stored in the cache so that may be re-used if the user jumps back to a previous input card, he doesn't have to retype but merely change what he wants to change. However, in some cases this functionality is causing a problem. Take a WAP chat system for instance where the same variable name is used over and over again, but with different content every time. Some browsers such as the one in the Nokia 7110 also have problems with clearing the variables even when it should.

In WML, the `<card>` tag has a parameter called **newcontext** which when **newcontext="true"** clears all variables. However, this also clears the navigation history which means that *Back* buttons will no longer work. If you want to clear the variables and the navigation history, then use **newcontext**.

To clear a variable, you can tell the browser to set the value of it to nothing. This is done like this:

```
<setvar name="one_variable" value=""/>
<setvar name="another_variable" value=""/>
```

However, that doesn't always work. In some cases you should be able to solve it with a fancier method of emptying the variable with an **onenterforward** event like this:

```
<onevent type="onenterforward">
<refresh>
  <setvar name="one_variable" value=""/>
  <setvar name="another_variable" value=""/>
</refresh>
</onevent>
```

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The Wireless FAQ

4.11 How to I access a database from WML?

The Wireless Markup Language does itself of course not include any database interface, nor does HTML. For those who come from the "web" world, you've most likely used some form of server script language such as PHP, ASP or Perl to perform this task. Exactly the same can be done when the user agent is a WAP device.

There is absolutely tons of excellent documentation on interfacing with databases for "web" applications available, and almost all of this can be used directly in the wireless environment. Really, the only difference is that the output needs to be in WML and not in HTML. Most of the work interfacing with databases has absolutely nothing to do with WML or HTML, and it would be a complete waste of time to rewrite this documentation in this FAQ.

Just to give you a few pointers, here's a few links. And remember that these scripts are for HTML user agents, but all you need to do is make sure the output is in WML and not in HTML.

[PHP driven databases](#) at [PHP Code Exchange](#)

[PHP driven database](#) at [Hyperhost](#)

[Website Database Basics With PHP and MySQL](#) from [DevShed](#)

[ASP driven Data Access](#) at [ASP Today](#)

And for those of you that are really lazy, try these:

Search for "[How do I access a database from PHP?](#)" with AltaVista

Search for "[How do I access a database from ASP?](#)" with AltaVista

Search for "[How do I access a database from Perl?](#)" with AltaVista

Search for "[How do I access a database from Java?](#)" with AltaVista

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4.12 How can I control caching when nothing else works?

Please read [this](#) article before continuing. It's important to know **when** to use cache control, and when **not** to use it. After all, caching is there to speed up the navigation process.

In some rare cases normal cache control will not work either because browsers or gateways simply do not comply with HTTP specifications, or because your application work in such a way that normal cache control can not be applied.

For instance, at the time of writing, the UP.browser 4.x does not seem to handle normal HTTP cache control headers, and so called META control header must be used in the WML deck. The only problem is that when the content you are trying to control is not a WML deck but an image, META headers can obviously not used as an image has binary content.

There are two methods of tricking the browser into reload a URL, regardless of the cache. The first is by far the better solution, but it might not work on all browsers. I repeat that such cache bypassing schemes must **only** be used when all else fails!

[James Skinner](#) (James.Skinner@nortelnetworks.com) has submitted the following method which involves adding a HTTP header called **Content-location:**. The method is known to work with the UP.browser series.

The following PHP code snippet will do just that, but any good server side script language can do the same.

```
<?
  header("Content-location: http://somewhere.com/some.url.that.doesnt.exist");
?>
```

The browser will now think that the content is on the fake URL, and cache that URL instead of the real URL.

The second method is simply to add a random string to the URL, and although nasty, it will work on all browsers. Just remember that if you're already passing parameters on the URL, make sure that the URL still has a correct syntax and that it's not getting too long.

The following WML with a small PHP snippet example will do just this. The function **date("U")** returns the numbers of seconds since the Unix Epoc (1st Jan 1970). I've used this method of creating a unique random number instead of a normal random routine because this ensures that the number is unique.

```
<card id="test">
  <p>The following URL will never be cached</p>
  <p><a href="http://someplace.com/somedeck.wml<?echo("?" .date("U"))?>">Click
here</a></p>
</card>
```

The URL in the code above will look like **http://someplace.com/somedeck.wml?973827728** where the number will change every time (that is, every second) the deck is loaded. The request parameter, everything after the question mark, will simply be ignored unless there's a script at that location which reads and parses the parameter.

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4.13 How can I use ASP to make WML contents more dynamic?

ASP (Active Server Pages) can in the same way PHP can, be used to make WML contents dynamic. For some great examples on how to do this, check out [Luca Passani's WAP and ASP articles](#)

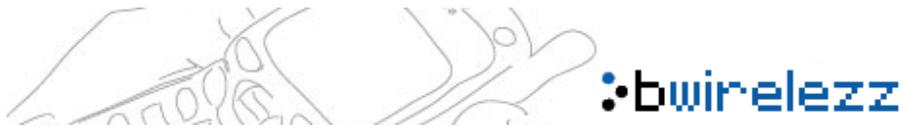
Also check [Jean-Luc Praz's](mailto:jeanluc@corobori.com) (jeanluc@corobori.com) many ASP driven examples at <http://www.corobori.com/wap/>

Related information

Chapter 8 in "[Professional WAP](#)" from Wrox

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The Wireless FAQ

4.14 How do I pass a variable from WML to ASP?

Let's say you have an ASP called "myasp.asp", and you have a WML variable called "wmlvar". When requested as "myasp.asp?wmlvar=something", you can grab the contents of the variable like this:

```
dim aspvar
aspvar = Request.QueryString("wmlvar")
```

The ASP variable "aspvar" will now contain the string "something". To make things easier, the ASP variable can of course have the same name as the WML variable.

Here is a sample showing different ways of passing variables

```
<%Response.ContentType = "text/vnd.wap.wml"%>
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<!-- VarTest.asp a code sample for Thewirelessfaq.com by Ed Alkema -->
<wml>
<%
dim i
dim z
dim NrThingy
dim Action

NrThingy = Request("NrThingy")
i = int(Request("i"))
Action = Request("Action")
z = Request.QueryString("z")

%>
<card id="foobar" title="Foobar" newcontext="true">
<p>z = <%=z%></p>
<p>i = <%=i%></p>
<p>NrThingy = <%=NrThingy%></p>
<p>Action = <%=Action%></p>
<p>Enter i <input name="i" type="text" maxlength="3" format="*N" /></p>
<p>
Choose nr Thingy
<select name="NrThingy" ivalue="<%=NrThingy%>">
  <option value="1">1 Thingy</option>
  <option value="2">2 Thingy</option>
  <option value="3">3 Thingy</option>
</select>
</p>
<p>
<anchor title="Show">Show Thingy
  <go href="vartest.asp?z=<%=i + 1%>" method="post">
    <postfield name="i" value="$(i)" />
    <postfield name="NrThingy" value="$(NrThingy)" />
    <postfield name="Action" value="Hidden" />
  </go>
</anchor>
</p>
```

```
</card>  
</wml>
```

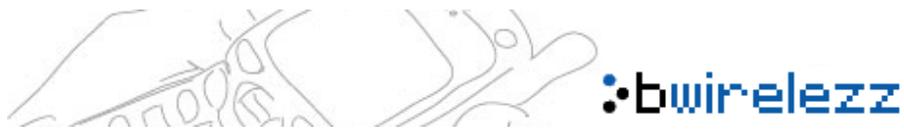
Related information

Chapter 8 in "[Professional WAP](#)" from Wrox

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4.15 Is there a list of other useful stuff for serving WML contents?



The Wireless FAQ

4.15 Is there a list of other useful stuff for serving WML contents?

For the Unix people there's the wml-tools by [Thomas Neill](mailto:ponder@pwot.co.uk) (ponder@pwot.co.uk) available at <http://pwot.co.uk/wml/> which includes cool stuff like a WML bytecode compiler and decompiler.

[Angus](mailto:angus@z-y-g-o.com) at [Zygo WAP](http://www.zygo.com) (angus@z-y-g-o.com) has developed a subclass of LDS's CGI.pm for WAP methods and WML output for use with Perl, and he's also working on a pipelineable WML compiler. All available at [Zygo WAP Tools](http://www.zygo.com/wap_tools/).

[RCP Distributed Systems](http://www.rcp.co.uk/distributed/Downloads) has a command line WML Compiler available at <http://www.rcp.co.uk/distributed/Downloads>. The compiler runs under Windows9x.

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4.16 How do I use XSL with WML and WAP?

Since WML is actually XML, and XSL transforms a XML document into another, different XML document, the question is appropriate. Please refer to Luca Passani's good article in the march 2000 issue of the American magazine [WebTechniques](#). The article is also available on the web at <http://www.webtechniques.com/archives/2000/03/passani/>

It's recommended that you have a look at something called [Cocoon](#) from the Gods of [Apache](#). "Cocoon is a 100% pure Java publishing framework that relies on new W3C technologies (such as DOM, XML, and XSL) to provide web content. The Cocoon project aims to change the way web information is created, rendered and served. This new paradigm is based on fact that document content, style and logic are often created by different individuals or working groups. Cocoon aims to a complete separation of the three layers, allowing the three layers to be independently designed, created and managed, reducing management overhead, increasing work reuse and reducing time to market. Web content generation is mostly based on HTML, but HTML doesn't separate the information from its presentation, mixing formatting tags, descriptive tags and programmable logic (both on server side and client side). Cocoon changes this view allowing content, logic and style on different XML files and uses XSL transformation capabilities to merge them."

Basically this means that Cocoon will read the HTTP header, work out which browser is used and then apply the correct stylesheet and do the XSL Processing.

Check this reference for a product called [LotusXSL](#) which is an XSL processor for transforming XML documents into HTML, text, or other XML document types.

At Sun's Java site, there's a section covering "[Java Technology and XML - Portable data, portable code](#)" with several tutorials, APIs and example code.

You might also want to look into XSLT for transforming XML tags into device-specific WML. Check <http://www.jclark.com/xml/xt.asp> for more details.

[Barry Dorrans](#) (barryd@bann.co.uk) also adds that Microsoft has in fact an XML/XSL rendering engine called XMLISAPI which supplies the same functions as Cocoon, and at TechEd Europe a seminar was dedicated to using it to serve WAP content. From the MS information "*The Microsoft XSL ISAPI Filter enables server-side XSL formatting for multiple device-types. It features automatic execution of XSL style sheets on the server, choosing alternate style sheets based on browser type, style-sheet caching for improved server performance, the capability to specify output encodings, and customizable error messages.*" The XMLISAPI DLL is available for free download, at <http://msdn.microsoft.com/Downloads/webtechnology/xml/xslisapi.asp>.

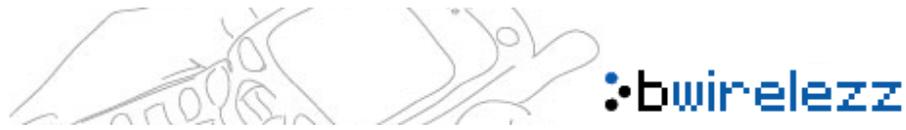
Related information

Chapter 9 in "[Professional WAP](#)" from Wrox

Chapter 10 in "[Professional WAP](#)" from Wrox

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4.17 How can I use Perl to make WML contents more dynamic?

Like almost all other server side script languages, Perl can also be used to do some pretty fancy stuff for the WAP environment.

One of the most frequently asked question around Perl and WAP is how to output the correct MIME type and document definition from Perl. Here's how to do just that:

```
print "Content-type: text/vnd.wap.wml\n\n";
print "<?xml version=\"1.0\"?>\n";
print "<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML
1.1//EN\" \"http://www.wapforum.org/DTD/wml_1.1.xml\">\n";
print "<wml>\n";
```

..and the rest of your code goes here..

Related information

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4.18 What is PUSHing and how does it work?

PUSH was added to [WAP 1.2](#), and is only available in WAP 1.2 environments. In short PUSH provides another way of sending data from a content or application server to a mobile user agent. The "traditional" way, PULLing is for the user agent to request the information, and then receive it. PUSH means that the server can send the data to the user agent without it having to ask for it.

The content or application server cannot send the data to the user agent directly, but will have to use a so called Push Proxy Gateway. This PPG sits between the internet based Push Initiator (the content or application server) and the mobile user agent. On the internet side, the Push Access Protocol is used, and on the mobile internet side, the Push Over-the-Air Protocol is used.

Note that the user agent does not automatically accept data from any content provider - only those that it has listed as trusted.

Currently the only WAP 1.2 development platform to support PUSH is the [Nokia Toolkit 2.0](#). Remember to [register](#) first. Note that the Nokia Toolkit 2.0 only support PUSHing internally. Meaning, you can push messages to from the toolkit interface to the emulator phone. If you try to point the toolkit to an external Push Proxy Gateway, the toolkit crashes. But as it says in the readme file that comes with the toolkit, PUSHing has not been fully tested.

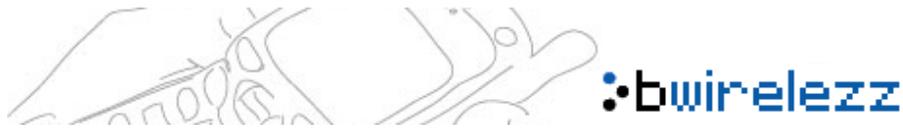
As soon as a publicly available PUSH capable development environment (that also supports actual Push Proxy Gateways) has been confirmed, the topic will be covered in detail in this FAQ. Until then, read the PUSH, Push Access Protocol and Push-OTA Protocol specifications available [here](#).

Related information

Chapter 16 in "[Professional WAP](#)" from Wrox

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Wireless FAQ - Demos

Note that most of these services require a WML capable browser.

To use these demos from a WAP device, please go to <http://www.thewirelessfaq.com/demos.wml>

[WAP FAQ Links](#) - Links to user submitted WAP applications

[Client Info Application](#) - Displays all HTTP header info from User Agent and Gateway

[Localization Demo](#) - Demo of localized text

[Basic Authentication Demo](#) - Demo of Basic Authentication protected directories

[Cookie Test Demo](#) - tests cookie capabilities

[PizzaCalc © © Demo Application](#) - a very useful tool for splitting pizza bills

[Cache Test Demo](#) - use to verify that your browser support HTTP cache control

[Character set encoding test](#) - test browser capabilities for special character sets.

[Character Entity Reference and Display table](#) - display all special characters and their character entities

[Subscriber number test](#) - Displays the subscriber number of a mobile phone

[Demo of animated images](#) - Displays a sequence of four images to fake animation

[Demo of dynamically generated images](#) - Displays the time graphically

[The amazing WAPCAM. Yes, a webcam on your phone!](#)

[Resolution Matrix](#) - Images for checking display sizes

[POST test](#) - Tests POSTing of variables

[GET/POST size test](#) - Tests amount of data that can be POSTed and GETed

[WTAI test](#) - Links to a telephone number using WTAI

[302 Redirect test](#) - Test if browser/gateway support HTTP 302 Redirects

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05 - WML specifics

Details on the Wireless Markup Language used in WAP device browsers. What works where.

[5.1 What is the general syntax of WML?](#)

[5.2 Do all WAP devices \(browsers\) comply with WML specifications?](#)

[5.3 Which phone uses which UP.browser version?](#)

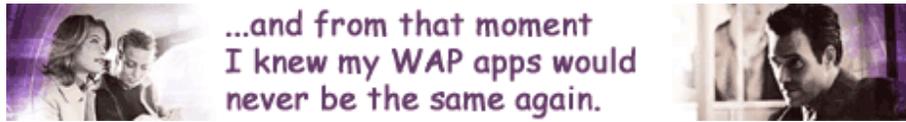
[5.4 Can I use HTML based developer tools to develop WAP applications?](#)

[5.5 Where can I find a WML validator?](#)

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5.1 What is the general syntax of WML?



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5.1 What is the general syntax of WML?

WML is very much like [XML](#). It is very strict compared to HTML for instance, which means that when it is parsed and interpreted by the micro browser there is not much room for error.

Just like in HTML, the language uses formatting tags surrounded by < and >. Most tags have start tags <tag> and end tags </tag>. What's contained inside the start and end tags are called elements. Some tags are so called empty-element, and have tags with no content <tag/>.

Most elements may have attributes which further describe what is to be done with the content within it. Attribute names **must** be in lower case, and the attribute values must be enclosed in double quotes. Some elements require attributes, and some attributes are optional. The general format of tags with attributes is <tag attribute1="value">.

Variables may be present in the WML cards, and their general format is \$(variablename)

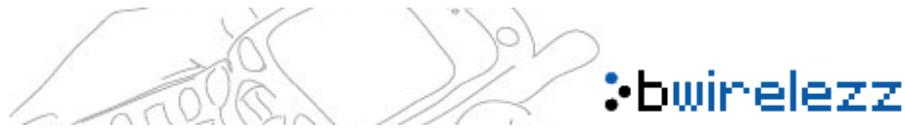
A WML deck has a specific format, and must begin with the following XML and document type declarations:

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

All elements in a deck must be placed within the <wml> and </wml> tags.

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5.2 Do all WAP devices (browsers) comply with WML specifications?

No. WAP device developers will constantly try to push the envelope on the specifications as WAP takes off. This makes life "interesting" for developers, but it should also ensure the rapid growth of the technology. If all manufacturers had to wait for every single little change to be incorporated into an agreed standard, we'd still be in the technological stone ages.

At present this is in many ways slowing down the progress of the technology, and it must be addressed and fixed by the [WAP Forum](#) immediately. In many cases however, the problem is caused by having too many lazy developers who can't write anything unless someone else wrote it already and put it into a library.

Attempts at making the matrix below contain all the information you as a developer needs to tailor you applications for each device have been abandoned, due to the fact that gathering the information requires about 10 people working around the clock :-) I suggest you combine the data from the matrix below with what you find at the links below, and you should end up with something that will at least take you closer to your goal.

[AnyWhereYouGo.com](#) also has a detailed list [here](#) which you will find very useful.

[WAPWala.net](#) also has a similar list [here](#), but it's more for the user and not the developer.

	Nokia 7110	Ericsson R320	Ericsson R380	UP.Browser
<i>Max card size</i>	1397 bytes	3000 bytes	3800 bytes	1492 bytes
<i>Max image size</i>	1397 bytes	3000 bytes?	3800 bytes?	1492 bytes?
<i>Rows in display</i>	4 plus title	5	7	Device dependent
<i>Cols in display</i>	19	14	Unknown	Device dependent
<i>Horizontal pixels in display</i>	95	101	304	Device dependent
<i>Vertical pixels in display</i>	45	52	98	Device dependent
<i>Pixel display ratio</i>	1:1.25	Unknown	1:1.23	Device dependent
<i>Text style</i>	None	Small, Bold, Emphasis, Strong	Small, Big, Bold, Italic, Emphasis, Strong	Small, Big, Bold
<i>Text alignment</i>	None. Forced left.	Left, Center, Right	Left, Center, Right. Indented paragraphs	Unknown
<i>Image alignment</i>	Forced center	Unknown	Unknown	Unknown
<i>Tables support</i>	None	Maximum 5x5 cells	Unknown	Unknown
<i>Touch screen</i>	No	No	Yes	No
<i>Icon buttons</i>	No	No	Yes	Unknown
<i>Calling numbers within WML</i>	"Use number" function	Supported through WTAI	Supported through WTAI	Supported in v.3.1 and higher
<i>Input elements</i>	Alone on row	Where placed	Where placed	Unknown
<i>Input formatting</i>	Only A, a, N, X, x, M, m and *	Unknown	Unknown	Unknown

5.2 Do all WAP devices (browsers) comply with WML specifications?

<i>Image links</i>	No	Yes	Yes	Unknown
<i>Links formatting</i>	Alone on row	Where placed	Where placed	Unknown
<i>Deck load sequence</i>	Text, then images, then optional timer start	Text, then optional timer start, then images. Note that timer may run out before card is shown as a result	Unknown	Unknown
<i>HTTP Redirect</i>	Supported	Supported	Supported	Supported

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5.3 Which phone uses which UP.browser version?



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5.3 Which phone uses which UP.browser version?

[Openwave.com Developer's Site](#) has this [excellent table](#) of which phones has which UP.browser version, and even which markup languages they support (HDLM, WML). Note that you must register to get access to the table (which you should do anyway :)

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5.4 Can I use HTML based developer tools to develop WAP applications?

In most cases a developer tool meant for PC based browsers with HTML, Java and JavaScript capabilities cannot be used for developing WAP applications. However, more and more developer tools are including WML support.

[Allair's ColdFusion 4.5](#) and [HomeSite](#) has some WML support, although it is clear that Allair could perhaps have put some more effort into clearing the bugs before releasing. Note that PHP and ASP is supported in ColdFusion/HomeSite, which we like. Also, be sure to check out [Marjolei Katsma's HomeSite Help site](#) for lots of information regarding ColdFusion/HomeSite.

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5.5 Where can I find a WML validator?

To make sure that your WML code is proper, you should use a WML validator.

[Zygo Communications](http://wap.z-y-g-o.com/tools/) has an excellent WML validator available at <http://wap.z-y-g-o.com/tools/> (among many other useful tools). The validator is written in Perl and is both available as an online utility and for download.

You can also visit :

W3schools.com

wapuseek.com

Neomar

Mcheck

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06 - WAP development specifics

Topics surrounding the development tools used for developing WAP applications.

[6.1 Where can I download the Nokia SDK?](#)

[6.2 Where can I download the Ericsson SDK?](#)

[6.3 Why can I not access pages on the internet from my emulator?](#)

[6.4 Why doesn't Basic Authentication work with the Nokia SDK?](#)

[6.5 What is the difference between WAP 1.1 and WAP 1.2?](#)

[6.6 Where can I download the Openwave SDK?](#)

[6.7 Where can I download Microsoft's Mobile Explorer?](#)

[6.8 What's special about the Microsoft Mobile Explorer?](#)

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6.1 Where can I download the Nokia SDK?



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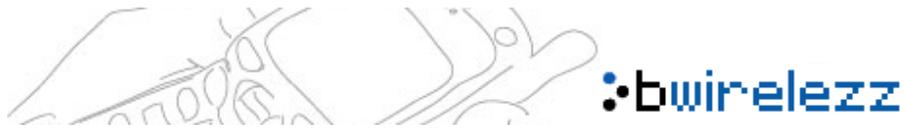
6.1 Where can I download the Nokia SDK?

After [registering here](#) you can download Nokia Mobile Internet Toolkit 3.0.

Download the Nokia Mobile Internet Toolkit 3.0

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6.2 Where can I download the Ericsson SDK?

After [registering here](#) you can download Ericsson WapIDE 3.1.1 Software Development Kit

Download the Ericsson WapIDE 3.1.1 Software Development Kit

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6.3 Why can I not access pages on the internet from my emulator?



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6.3 Why can I not access pages on the internet from my emulator?

Most emulators and toolkits can view pages that are located on the internet in addition to viewing pages that are on your local drives and your local intranet. It is however common, at least for larger companies that you have to go through a so called proxy server to gain access to the internet. If you have to go through a proxy server to get to websites with your HTML based browser, so will the WAP emulator.

Note that some emulators might not support proxy servers, but most of them do. Setting this up in the emulator should be relatively easy. All you need is the hostname or IP address of the proxy server, and the portnumber needed for internet access. If you do not have this, your systems/network administrator will have this. You could also check the settings for your Netscape/IE.

In some cases the proxy server will need a userid and password to gain access to the internet. Some emulators have support for this as well. You should be able to tell, if there's a userid/password field in the proxy settings config for your emulator.

In some rare cases, where the proxy server is the dreaded Microsoft Proxy Server, you might encounter additional problems. By default, this proxy server accepts only one type of authentication (userid/password). The authentication is known as NTLM and is a proprietary MS authentication, for which there is very little support in the non-MS world. (And thank God for that!) The best solution to this problem is to throw the MS Proxy Server out the window and replace it with something better, but you could also ask the person in charge of the MS Proxy Server to enable so called "Basic Authentication".

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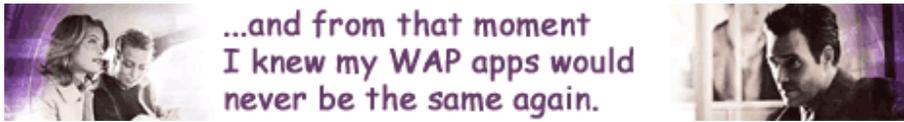
The Wireless FAQ

6.4 Why doesn't Basic Authentication work?

It seems that some developers of browsers and emulators simply forgot about Basic Authentication. Basic Authentication has been confirmed to work with the real Nokia 7110 with firmware version 4.73 and later. In general, all **good** browsers and emulators fully support Basic Authentication.

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6.5 What is the difference between WAP 1.1 and WAP 1.2?

Currently the majority of devices and applications comply more or less with the [WAP 1.1](#) specifications. [The WAP Forum](#) has released the specifications for [WAP 1.2](#) and it's definitely worth noting the differences, and most of all, how quickly the specifications evolve. Print the specifications out in a thousand copies and bang every journalist who says WAP is dead over the head with it! :-)

In short, the important new features in WAP 1.2 are as follows. For a description of each feature, please refer to the [WAP 1.2 Specifications](#). You are also reminded that the [The WAP Forum](#) is the **authoritative** source for these specifications.

New specifications

- UAPROF (User Agent Profile) which basically allows the user agent (the browser if you will) a way to tell the content provider what its capabilities are so that the content can be formatted to get the best functionality on this particular user agent. Full specs available [here](#).
- PUSH. PUSHing in short means that an application server can send data directly to the application environment, the user agent. For more information PUSHing, see [this](#) page.
- (..more to follow...)

WML specifications

- **accesskey** attribute added to `<a>`, `<anchor>` and `<input>` tags. The **accesskey** attribute will allow the user to jump to a specific anchor or input field by pressing a single key.
- `<pre>` tag which looks like it didn't make it into the released version of the specifications. We'll assume that it's identical to the HTML tag which encloses preformatted text.
- **enctype** attribute added to `<go>`. Used to specify how data sent from the browser should be encoded, either **application/x-www-urlencoded** or **multipart/form-data**. For GETs, only the first of these apply of course.
- **align** attribute added to `<table>` tag. Specifies the alignment of the contents within a table column with values L, R, C and D for Left, Right, Center and Default.
- The format of the `<input>` tag formatting attribute **nf** has changed from an absolute value to a range from 0 to n.
- Character encoding is no longer dependent on what is specified in the `<meta>` tags.

WMLScript standard libraries

- URL library now conforms with [RFC2396](#)
- Clarification on how non US-ASCII characters are represented in strings. "Non-US-ASCII characters must be converted using the character codes used in the native character set."

WEA Specifications

- Descriptions of Multipart Messages clarified (see MIME at [RFC2045](#))
 - **application/vnd.wap.multipart.mixed**
 - **application/vnd.wap.multipart.related**
 - **application/vnd.wap.multipart.alternative**
 - **application/vnd.wap.multipart.form-data**

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Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

6.6 Where can I download the Openwave SDK?

You will need to download the appropriate version of Openwave SDK to develop applications for different versions of Openwave Mobile Browser (formerly UP.Browser). Each version of Mobile Browser supports one or more native markup languages. The SDK for a given browser version includes the appropriate programming and style guides, sample code, and browser runtime environment.

[Choose the appropriate SDK](#)

[[Main](#)] [[06 - WAP development specifics](#)]

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6.7 Where can I download Microsoft's Mobile Explorer?

Two devices that use the [Microsoft Mobile Explorer](#), are the [Benefon Q](#) and [Sony CMD-Z5](#).

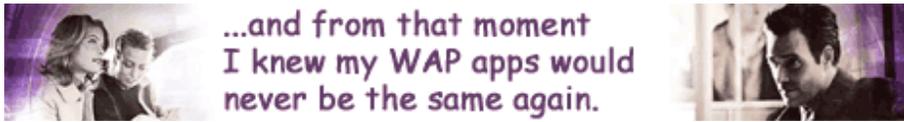
More information on Benefon can be found at their [developers section](#).

The Microsoft Mobile Explorer with skins for the Benefon Q is available after [registering](#) as a developer at the Benefon site.

More information on creating wireless applications using Microsoft Technology can be found at <http://www.microsoft.com/mobile/phones/default.asp>

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The Wireless FAQ

6.8 What's special about the Microsoft Mobile Explorer?

The [Microsoft Mobile Explorer](#), or MME, is a sort of dual mode browser in that it accepts both HTML and WML code. This presents all sorts of interesting new problems such as when presenting the same content in either HTML or WML based on what browser is used, how do you choose between HTML and WML when this browser supports both. This is not new, as the [Opera](#) browser is primarily a HTML browser, but supports WML. The MME does however present the data types in the correct order, i.e. HTML before WML, so if your browser detection code is correct you should have no problems.

After testing the MME Emulator with a very long list of sites, I have however found that everyone is using bad browser detection code. Most seem to rely on the fact that the string "Mozilla" means that it's a HTML capable browser with all capabilities such as Netscape or Internet Explorer. Be warned! There are many HTML browsers out there that do not have the word "Mozilla" in their user agent string. Instead, ask what type of data the browser can accept. [This](#) is an example on how to do that.

Note that the MME Emulator does not accept textual WML code, only tokenized WML (aka WMLC) requiring (like all WAP devices) a gateway to do the conversion from WML to WMLC.

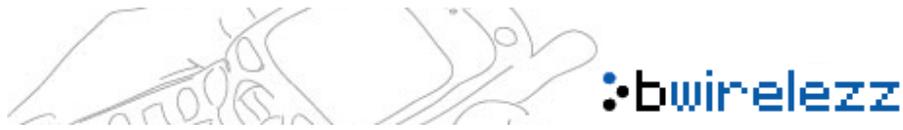
The MME also accepts images of the JPEG and GIF format as well as WBMPs. In addition, the MME sends out a HTTP header string called **HTTP-DISPLAY-AREA** which tells the content server (web server) what the display size is. Very useful. If it had only passed along other info as well, we could be jumping for joy :-)

The MME identifies itself via the User Agent string as a Mozilla/1.22 compatible device. The complete id string for the MME Emulator is **Mozilla/1.22 (compatible;MMEF20;CellPhone)**. Again useful info.

When using the MME Emulator, remember that the device operates in two modes. In one mode the device will talk to the content server (web server) directly, and read HTML and/or tokenized WMLC. Accessing a resource that outputs textual WML in this mode will not work unless you tell the MME Emulator where to find a WAP gateway. In this mode, all WAP requests are handled by the WAP gateway, and the device now (with the help of the WAP gateway) accepts textual WML.

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The Wireless FAQ

07 - Making it look fancy

Tips and tricks on how to stun your users by making your applications work like a race-horse and not look like a donkey.

- [7.1 Can WAP devices use graphical images instead of just text?](#)
- [7.2 What size screens will I be developing for?](#)
- [7.3 How do I use animated images?](#)
- [7.4 My WBMP images look bad, what can I do?](#)
- [7.5 Can I generate dynamic WBMP images on-the-fly?](#)
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- [7.21 How is the WML Extension localsrc attribute used?](#)
- [7.22 How is the "accesskey" attribute used?](#)
- [7.23 How can I tell which WML version a device supports?](#)

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7.1 Can WAP devices use graphical images instead of just text?

The WAP specifications allow for the use of a graphics format called WBMP. It is a 1 bit (either black or white) version of the BMP format. Consequently, all graphics must, in order to be compliant to the specifications, be converted into wbmp.

There are certain limitations that must be observed, when using WBMP. An image should not be larger than 150 x 150 pixels. Bear in mind that the WAP device screen is very limited. For instance the [Nokia 7110](#) screen is 96 pixels (width) by 65 pixels (height), so 150 by 150 pixels would look enormous, and take up more than the entire screen. Furthermore, the size of the graphics cannot exceed 1461 bytes, due to WAP phone memory limitations.

Not all WAP devices can display graphics. Consequently, the "alt" option in the tag must be used, so that users of non-graphics WAP devices will be able to see an alternative textual representation instead of the graphics.

[WAP Tiger](#) has a very simple command line tool to convert normal BMP files to WBMP available at <http://wap.infotiger.de/download.asp>. Both MS-DOS/Windows and Linux version available.

You can find a free Photoshop/Paint Shop Pro plugin at <http://www.rcp.co.uk/distributed/Downloads> - you are required to identify yourself first. Most WAP device developer kits can also convert images to WBMP.

[Macromedia](#) has an export plugin for their [Fireworks](#) package that lets you export WBMPs. The PC version is available at http://download.macromedia.com/pub/fireworks/xtras/wbmp_im_ex.exe and a Mac version is available at http://download.macromedia.com/pub/fireworks/xtras/wbmp_im_ex.hqx.

[WebCab.de](#) has a neat online WBMP editor at <http://webcab.de/woe.htm> which will let you create a WBMP image from scratch, upload and edit an existing one or generate one from hex data in the URL. If you have access to a server side script language but not to a tool that can generate dynamic WBMPs on-the-fly, this last option can generate the images for you!

There is also a free PIC2WBMP "stand-alone" converter available from <http://www.gingco.de/wap/>. However, the application requires Java Runtime, so if you're new to this, you should download the Paint Shop Pro plugin above and download the latest version of Paint Shop Pro at <http://www.jasc.com/download.asp>. Paint Shop Pro is time limited shareware in the unregistered version, and costs only \$99 USD to register.

[Surerange Analysis Ltd](#) has a free product called [ImageConvert Developer](#) which is a single-threaded ActiveX control that converts images from GIF and JPEG to WBMP format. It comes with an example Visual C++ 6 project showing how easy it is to use.

[Applepie Solutions](#) provide an online, web based GIF to WBMP converter at <http://www.applepiesolutions.com/image2.wbmp/>. You specify the URL of the file you want to convert, and it lets you download the converted image.

In some cases you might also want to display a WBMP image in a HTML environment. For this, [Andre de Leiradella](#) (leiradella@writeme.com) has produced a Java and C based application that will output a GIF image from WBMP input as it would look on a small LCD display. The C version can be run as a CGI. The application is available at http://www.geocities.com/andre_leiradella/.

Related information

[WAP Shareware's](#) Software Directory
palowireless.com

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Authoring for Multiple WAP devices
Absolutly NOT.... OUI

The Wireless FAQ

7.2 What size screens will I be developing for?

The WAP device display varies a lot. Some support graphics, some only text. Just to give you some examples, [Mitsubishi's](#) yet unreleased WAP capable phone has a 3 line, 12 character display. [Nokia's 7110](#) has a screen resolution of 96 (width) by 65 (height) pixels. Although images can be slightly larger, the maximum display area for images is 95 (width) by 45 (height) pixels. The pixels on the 7110 are also slightly taller than they are wide. The ratio is approx. 1.25 times higher than wider. Ie. a square would look like a rectangle 1.25 times taller than wider. The same goes for circles, which would have a slight oval shape.

[Ericsson's R320](#) phone has a similar sized display. The exact measures are 101 (width) by 52 (height). The display fits four text lines, and text is wrapped by default.

[Ed Chew](#) (Ed.Chew@scoot.co.uk) has checked the "R380 Design Guideline for WAP Services", and found that display on the [Ericsson R380](#) has a resolution of 360x120 pixels (83x28mm), with 0.23 dot pitch, and the browser area is limited to 310 (width) by 100 (height) pixels, including top margin of 2 pixels, and a left and right margin of 3 pixels each. This gives a 'real' area of 304 by 98 pixels.

To be absolutely sure what the display size is, there is a resolution matrix available in the demos section at <http://www.thewirelessfaq.com/demos.asp> (Select "Resolution matrix"). The deck at that location will let you display three different sized images with one vertical and one horizontal line per ten pixels, and single pixels for every other pixel. From that you should easily be able to see what the actual resolution is. Note that there are three different image sizes, 80x80, 100x100 and 120x120 pixels, because some browsers do not like to load images larger than what they can display. If you can't even load the smallest of the pictures, please let [me](#) know what kind of browser you are using.

Because many displays have pixels of rectangle shapes rather than squares, many developers remap their images so that that a square looks like a square, and a circle look like a circle. However, this method is not recommended unless you can be absolutely sure that you know which hardware the user is using. An image that looks perfect on a 7110 will look bad on a R380.

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The Wireless FAQ

7.3 How do I use animated images?

The Wireless Bitmap image format does not have support for animation such as the widely used GIF format of the HTML world. Instead it is possible to create animations using the WML <ontimer> tag. Please note that this will in most cases not give you what you expect.

To give you some idea on how it will look, you can try the Animated Images Demo available at the WAP/WML FAQ Demo Apps link page at <http://www.thewirelessfaq.com/demos.asp> or if you feel like typing, you can go directly to the application at <http://allnetdevices.com/faq/apps/anim.asp>.

When animating images like this, remember that the micro browser in a WAP device has limited memory. If you cannot fit all the images into memory all at once, the browser will have to load the images it can't fit, and your animation will be interrupted by the loading process.

[Nic Mulvaney](mailto:nic.mulvaney@wuzap.org) (nic.mulvaney@wuzap.org) has written a cool tool for sequencing WBMP animations. The program generates the WML code which can be pasted directly into your existing code. The tool is called WAP/WBMP Sequencer and is available at <http://gizma.com/wap/>.

The source for the demo application above is as follows:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN\"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<!-- Code written in Microsoft NOTEPAD.EXE. (c) Espen Lyngaas 2000 Color Line ASA -->
<wml>
  <card id="image1" ontimer="#image2">
    <timer value="10"/>
    <p>
      
    </p>
  </card>
  <card id="image2" ontimer="#image3">
    <timer value="10"/>
    <p>
      
    </p>
  </card>
  <card id="image3" ontimer="#image4">
    <timer value="10"/>
    <p>
      
    </p>
  </card>
  <card id="image4" ontimer="#end">
    <timer value="10"/>
    <p>
      
    </p>
  </card>
  <card id="end" title="The End">
    <p>
      This is the end of the animation, but you can
      <anchor>run it again.
        <go href="#image1">
          </go>
        </anchor>
    </p>
```

7.3 How do I use animated images?

```
</card>
</wml>
```

If you have access to a server side scripting language such as [PHP](#), the same deck can be written much simpler like this:

```
<?
  header("Content-type: text/vnd.wap.wml");
  echo("<?xml version=\"1.0\"?>\n");
  echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
  echo("<!-- Code written in Microsoft NOTEPAD.EXE. (c) Espen Lyngaas 1999 Color Line
ASA -->\n");
?>

<wml>

<?
  for($card=1;$card<5;$card++) {
    echo("<card id=\"image\".$card.\"\" ontimer=\"\#image\".$card+1.\">\n");
    echo("<timer value=\"10\"/>\n");
    echo("<p>\n");
    echo("<img src=\"anim\".$card.\".wbmp\" alt=\"Anim\".$card.\"\"/>\n");
    echo("</p>\n");
    echo("</card>\n");
  }
?>
<card id="image5" title="The End">
<p>
  This is the end of the animation, but you can
  <anchor>run it again.
    <go href="#image1">
      </go>
    </anchor>
</p>
</card>
</wml>
```

Related information

[WAP Shareware's Software Directory](#)

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Authoring for Multiple WAP devices
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The Wireless FAQ

7.4 My WBMP images look bad, what can I do?

The Wireless Bitmap format supports only two colors, and making images look good can be tricky. However, your favorite image editor might have a function for decreasing the number of colors, and it might even have a method of doing this called Floyd-Steinberg. One such program is [Jasc Paint Shop Pro](#). Paint Shop Pro is inexpensive compared to others, and there's even a WBMP plugin available which allows you to save WBMPs directly. You can download a 30-day evaluation copy of Paint Shop Pro at the link above. An other program is Macromedia Fireworks 4, You can [download a 30-day evaluation copy](#)



256 color image



2 color image Floyd-Steinberg 2 color image No Dither

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The Wireless FAQ

7.5 Can I generate dynamic WBMP images on-the-fly?

Of course. You will, like so very often, need some form of server side script language like [PHP](#) or ASP or Perl to do it. In addition, you'll most likely need some form of image converter because few server side script languages can generate WBMP images by themselves.

How it's all done depends on the script language, but here's a PHP example which will generate the a WBMP image.

The image above is created by GD which is compiled into PHP. Note that current versions of GD do no longer create GIF images, but so called PNG (Portable Network Graphics) images. Small parts of the code below needs to be changed from GIF to PNG if you're using the current version of PHP. In addition, and what does the conversion from either PNG or GIF to WBMP, is [DuPont's Image Magick](#) which converts between practically any thinkable format. It is available for most platforms.

In the code, I've used the PHP function ImageCreateFromGif() because I wanted to put some text on the GIF image. You can generate a blank GIF/PNG image with PHP's ImageGreate() function instead.

And now for the code:

```
<?
  // hardcoded "variables" are safer!

  $blank = "./wapclock_blank.gif"; // path to blank GIF
file - not really needed (see above) // Look at it at

http://wap.colorline.no/wap-faq/apps/wapclock_blank.gif // path to input file
  $input = "/tmp/wapclock.gif"; // path to input file
generated by PHP
  $output = "/tmp/wapclock.out"; // path to temporary
output file. Extension is irrelevant
  $convert = "/usr/local/bin/convert"; // path to
ImageMagick convert

  if($format == "gif") { // if it's GIF, send
    that Content-type
    header("Content-type: image/gif");
    $type = "GIF";
  }
  else {
    if($format == "wbmp") { // if it's WBMP, send
    that Content-type
    header("Content-type: image/vnd.wap.wbmp");
    $type = "WBMP";
    }
    else {
    header("Content-type: text/plain"); // hope that the
browser can read this // or someone forgot
    $type = "";
to set the format variable
  }
}

header("Expires: Mon, 26 Jul 1997 05:00:00 GMT"); // turn off caching
header("Last-Modified: " . gmdate("D, d M Y H:i:s") . " GMT");
header("Cache-Control: no-cache, must-revalidate");
header("Pragma: no-cache");
```

7.5 Can I generate dynamic WBMP images on-the-fly?

```
$im = imagecreatefromgif($blank); // create a GIF file
from an empty GIF file (see faq)

$time = date("H:m:s"); // put the current
time into the time variable

imagestring($im,4,6,15,$time,0); // Place time
variable sort of in the middle, with font size 4

ImageGif($im,$input); // generate a GIF
file with PHP (see faq)
ImageDestroy($im); // empty the GD
temporary buffer

if(strlen($type) > 0) { // if the type is
known
    exec($convert." ".$input." ".$type." ".$output); // do the conversion
}
else {
    echo("Unknown format!\n"); // or do nothing
    exit; // and stop
}

$fd = fopen($output,"r"); // open the converted
file
$content = fread($fd,filesize($output)); // read everything
into a variable
fclose($fd); // close the file
echo($content); // pour out the
content
?>
```

All the code above does is output an either GIF or WBMP data stream. To use the actual image in a WAP application, you'll have to do something like this:

```
<?
    header("Content-type: text/vnd.wap.wml");
    echo("<?xml version=\\"1.0\\"?>\n");
    echo("<!DOCTYPE wml PUBLIC \\"-//WAPFORUM//DTD WML 1.1//EN\\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
    echo("<!-- Code written in Microsoft NOTEPAD.EXE. (c) Espen Lyngaas 2000 Color Line
ASA -->\n");
?>

<wml>
    <card id="wapclock" title="WAP Clock">
        <do type="prev" label="Reload Image">
            <go href="\<?echo($PHP_SELF)?>" />
        </do>
        <p>
            
        </p>
    </card>
</wml>
```

This WAP application is, like all the others, available in the "Demos" section here: <http://www.thewirelessfaq.com/demos.asp>.

Related information

[WAP Shareware's](#) Software Directory

7.5 Can I generate dynamic WBMP images on-the-fly?

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The Wireless FAQ

7.6 How can I send e-mail from a WAP device?

In the HTML world, there's a simple way to trigger the default e-mail editor by using **mailto:.** At present there is no such thing in WML, and e-mails must be entered through a WML form.

[Tarique Sani](#) has released a completely brilliant POP client for WAP devices under GPL, called WAPpop, and this is available for download at [SANIsoft's site](#). WAPpop uses PHP and MySQL, which both come preinstalled on most Linux distributions.

If you need to build another type of user interface around the mail function, a typical email form would look something like this:

```
<wml>
  <card id="edit" title="Email Editor">
    <p>From: <input type="text" name="from" format="*M"/></p>
    <p>To: <input type="text" name="to" format="*M"/></p>
    <p>Subject: <input type="text" name="subject" format="*M"/></p>
    <p>Message body: <input type="text" name="body" format="*M"/></p>
    <p>
      <anchor>Send this mail
        <go method="post" href="http://some.host/mailhandler?action=send/">
          <postfield name="from" value="$(from)"/>
          <postfield name="to" value="$(to)"/>
          <postfield name="subject" value="$(subject)"/>
          <postfield name="body" value="$(body)"/>
        </go>
      </anchor>
    </p>
  </card>
</wml>
```

In the code above you'll notice the reference to **http://some.host/mailhandler**. This is a CGI, a server side script of some sort that will handle the input from the mail form and transform it into an e-mail message and send it. There are virtually thousands of such scripts available in all sorts of script languages.

If you plan to use a similar form for sending mail, you will most likely have to edit the variable names. Also note that there's a limit to the amount of data that can be sent from your WAP device to the server. Long messages will most likely break.

To demonstrate how it works, the following [PHP](#) script could be used to handle mail from the form. It will format a WML deck with a card that tells the user if the mail was sent or not. For real life applications, you should add checks for things like well formatted e-mail addresses etc.

```
<?
  header("Content-type: text/vnd.wap.wml"); // Tell the client that
this is a WML deck
  echo("<?xml version=\"1.0\"?>\n");
  echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n");

  $mailer = "wap.colorline.no"; // The name of your mail
server
  $from = $from." (WAP user at ".$mailer.)"; // Format the from field

// Add the from field
and some // character handling to
the extra headers
```

7.6 How can I send e-mail from a WAP device?

```
$extraheaders = $from."\nContent-Type: text/plain;\ncharset=iso-8859-1\nContent-Transfer-Encoding: 8bit";

echo("<wml>\n"); // Start sending out the
WML deck
if(mail($to,$subject,$body,$extraheaders)) { // Use PHP's internal
mail functionality
    echo("<card id=\"sent\" title=\"Mail sent\">\n"); // Mail was successfully
sent
    echo("<p>Mail was sent successfully</p>\n");
    echo("</card>\n");
}
else {
    echo("<card id=\"notsent\" title=\"Mail failed\">\n"); // The mail could not be
sent
    echo("<p>Unable to send mail</p>\n");
    echo("</card>\n");
}
echo("</wml>\n");
?>
```

For security reasons the code above does not have a demo on this server. You should also consider this. The code above gives basically anyone access to send e-mails to anyone - anonymously.

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WAP 2.0, XHTML, IOT, OTA, WML.....
WMLProgramming is "the" list!

The Wireless FAQ

7.7 Is it possible to "link" to a telephone number?

In some cases, say when displaying a list of telephone numbers, it would be great to have a functionality where you could "link" directly to the telephone number just by selecting it. The connection would then close, and the telephone would automatically dial the new number, for instance by doing a **dial:12345678** very much like the **mailto:** tag of the HTML world.

This functionality is being incorporated by more and more browsers, but not all - yet. Openwave.com, Mitsubishi and Ericsson has incorporated this functionality into their browsers based on the [Wireless Telephony Interface specifications](#) (WTAI). WTAI will allow the following URL when accessed to disconnect the WAP call and dial the specified number.

```
<go href="wtai://wp/mc;+4712345678">Make a call to +47-12345678</go>
```

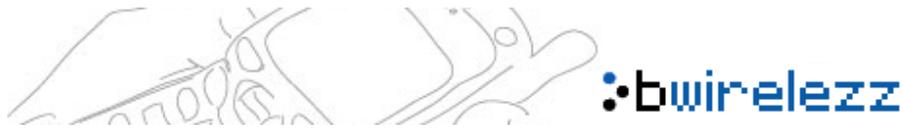
Nokia's 7110 (and others with a similar browser) have a function called "Use number" which will read through the current WML card looking for something that looks like a telephone number. For more information on this function, see [this section](#).

Related information

Chapter 17 in "[Professional WAP](#)" from Wrox

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7.8 How can I prevent a form from having empty fields?

In most cases you want to make sure that a user actually enters something into input fields and not just leave them blank. This can best be done on the server side with a script language command checking for the length of the contents of the variable in question, but it can also be done directly in WML.

In WML this is done by using the correct formatting codes, or if that's not supported, adding a parameter called **emptyok=false** to the input tag. Note that it only means that the user cannot force the input to be blank. If you leave out the **value="something"** parameter or put **value=""** the user can still send empty fields.

The following line will accept any value to the "username" field, even if the user clears the field completely. He will be able to return from input mode, even if the field contains nothing.

```
<input name="username" type="text" value="Enter something" format="*M"/>
```

The following line will accept any value to the "username" field, except if the user clears the field completely. He will not be able to return from input mode until the field contains something.

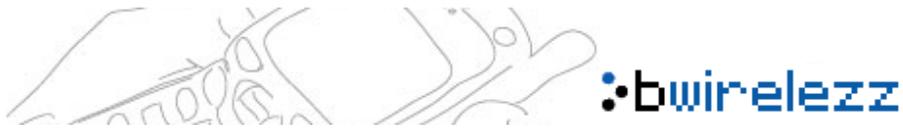
```
<input name="username" type="text" value="Enter something" format="M*m"/>
```

However, the above applies to **most** browsers. On Nokia 7110, the **emptyok** parameter must be used to get the same effect:

```
<input name="username" type="text" value="Enter something" format="*M"
emptyok="false"/>
```

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7.9 How do I use option fields when the display cannot fit all of them?

Most WAP phone displays are so small that it's difficult to fit more than three or four option fields on the screen at the same time. By splitting up the option fields like shown below, it is possible to have as many option fields as memory will allow.

```
<select title="longselectlist">
  <optgroup title="option1">
    <option>option1-1</option>
    <option>option1-2</option>
    <option>option1-3</option>
  </optgroup>
  <optgroup title="option2">
    <option>option2-1</option>
    <option>option2-2</option>
    <option>option2-3</option>
  </optgroup>
  <optgroup title="option3">
    <option>option3-1</option>
    <option>option3-2</option>
    <option>option3-3</option>
  </optgroup>
</select>
```

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7.10 Is it possible to "preload" images in WML?

In the HTML world, images can be preloaded using simple JavaScript commands, but in WML or WMLscript there is no such thing. [Paul St. George](mailto:email@paulstgeorge.com) (email@paulstgeorge.com) provides this explanation on how to trick the browser into loading images without showing them. The images, if small enough, can then be read from the WAP device's cache quickly. Yes, it can be used for animating images :) And yes, if all the images will fit into the WAP device's memory, you won't get a "Connecting to service.." message in between each image either :)

[Nic Mulvaney](mailto:nic.mulvaney@wuzap.org) (nic.mulvaney@wuzap.org) has written a cool tool for sequencing WBMP animations. The program generates the WML code which can be pasted directly into your existing code. The tool is called WAP/WBMP Sequencer and is available at <http://gizma.com/wap/>.

You basically need to make some spacing images that are 1 pixel wide by the desired height. Make the images transparent apart from a 1 pixel x 1 pixel blob at each end. Use one of these that is 72 pixels high to make the first card appear empty. Use others at various heights to adjust the height of images so that they are vertically aligned.

In the example below, note that you might have to change the value of the timer to allow enough time for your particular images to load.

Two examples using this for animating images are available at

<http://www.hashstar.f2s.com/anim/plane/index.wml> and <http://www.hashstar.f2s.com/anim/wmail/index.wml>

```
<wml>
  <card id="p" ontimer="#f1">
    <!-- Adjust this timer to taste. -->
    <timer value="10"/>
    <p align="center">
      
    </p>
    <p>
      
    </p>
    <p>
      
    </p>
    <p>
      
    </p>
    <p>
      
    </p>
    <p>
      
    </p>
  </card>

  <card id="f1" ontimer="#f2">
    <timer value="10"/>
    <p align="center">
      
    </p>
    <p align="center">
      
    </p>
  </card>

  <card id="f2" ontimer="#f3">
```

7.10 Is it possible to "preload" images in WML?

```
<timer value="10"/>
<p align="center">
  
</p>
<p align="center">
  
</p>
</card>

<card id="f3" ontimer="#f4">
  <timer value="10"/>
  <p align="center">
    
  </p>
  <p align="center">
    
  </p>
</card>

<card id="f4" ontimer="#f5">
  <timer value="10"/>
  <p align="center">
    
  </p>
</card>

<card id="f5" ontimer="#f1">
  <timer value="10"/>
  <p align="center">
    
  </p>
</card>
</wml>
```

Related information

[WAP Shareware](#)'s Software Directory

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7.11 Is it possible to change the font displayed in a browser?



The Wireless FAQ

7.11 Is it possible to change the font displayed in a browser?

Really the answer is no in most cases. Many browsers support tags that will in some way change the font making it bold, italic etc, but the typeface itself can probably not be changed. I have yet to see a browser that can, and there is no tag in WML specifically for this.

[Morpheme](#) does however have a nice online snippet called [Dwbmp](#) that will let you write text into a WBMP image. Use of the tool is free of charge for non-commercial users. Currently the tool supports six different types of fonts.

Note that for a few browsers that does not support images as anchors (Nokia 7110 for instance), you obviously cannot have these special font WBMPs clickable.

For those of you who have access to the [PHP](#) script language or another script language that has GD support, WBMPs with TrueType fonts and even Postscript fonts can actually be generated on-the-fly.

Related information

[WAP Shareware's](#) Software Directory

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7.12 How do I get a WML card to refresh itself?

Those of you who have some experience from the "web" environment will most likely have used the `<meta http-equiv="refresh" content="1;http://somewhere.com/">` tag to force a browser to load a new or the same page.

Although some META tags are supported in the WAP environment, a much better way of doing the exact same thing in WML is to use the `<ontimer>` tag.

The following piece of code will force the browser to load **another** deck after a certain time. For the example below, the deck will jump to another deck called **nextdeck.wml**.

```
<?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="splashscreen" ontimer="nextcard.wml">
    <timer value="40"/>
    <p>Please wait for the timer to run out...</p>
  </card>
</wml>
```

The following piece of code will force the browser to reload **the same** card after a certain time. For the example below, the deck file is called **loop.wml**.

```
<?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="loop" ontimer="loop.wml">
    <timer value="40"/>
    <p>This text will be shown over and over again...</p>
  </card>
</wml>
```

Note that for a browser to actually reload the same card, you will need to bypass the browser's caching mechanism, or else the card will be loaded from the browser's memory, and not from the server. Caching control is explained [here](#).

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7.13 How do I use streaming media in WAP?



The Wireless FAQ

7.13 How do I use streaming media in WAP?

A very short time ago I would have said "you can't" but now a company called [Sontora](#) have released information about a product called [Mobicast](#) that will let you play streaming audio on any WML 1.1 device. This includes MP3, Windows Media and RealAudio. All done without having to modify the device in any way.

Please visit their site for more details on the product.

The reason I usually would have said it can't be done is that the WAP protocol suite does not really give access to hardware. Hardware to play audio or whatever. But then again, neither does the "web" protocol suite. For the "web" environment, this is done with separate clients and plug-ins. Although there's nothing prohibiting the streaming of the data on the WAP environment, there's really nothing at the other end to play it.

I'm hoping that this FAQ will be able to bring you developers at least some details and a modest developer support on this new technology.

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Authoring for Multiple WAP devices Absolutly NOT... OUI

The Wireless FAQ

7.14 How much data can I send back to the server using GET or POST?

The amount of data you can send back using a GET or POST seems to be device dependent. A GET transfer (aka a request) sends variables on the URL, and the amount of data that can be sent is much less than what you can send using a POST. For instance, the Nokia 7110 seems to have a GET limit of very close to 512 bytes, while it handles POSTs up to the max size of the compiled deck (aprox 1300 bytes). The UP.SDK 4.0 has a limit of some 970 bytes using GET and up to the max size of a compiled deck for a POST.

Obviously, the card sometimes hold the contents of the variable(s) that are sent to the server, and since there is a compiled deck size limit, this will influence the total amount of data you can transfer.

There's not much difference between doing a POST or a GET. The following is an example of the common, but not very pretty way using GET.

```
>
<input type="text" name="var1" format="*N"/>
<p>
  <anchor>Send it
  <go href="somescript.cgi?variable=$(var1)" method="get"/>
</anchor>
</p>
```

And the following; still a GET request, but using **<postfield>** to set the variables which makes for much prettier code, and since it's almost identical to a POST, easy to change from a GET to a POST.

```
>
<input type="text" name="var1" format="*N"/>
<p>
  <anchor>Send it
  <go href="somescript.cgi" method="get">
    <postfield name="variable" value="$(var1)"/>
  </go>
</anchor>
</p>
```

And then a straight POST.

```
>
<input type="text" name="var1" format="*N"/>
<p>
  <anchor>Send it
  <go href="somescript.cgi" method="post">
    <postfield name="variable" value="$(var1)"/>
  </go>
</anchor>
</p>
```

To find out exactly how much data you can transfer, it's down to testing, and for this purpose there is a test application available at <http://wap.colorline.no/wap-faq/apps/putsizesize.php3>. The application is also available in the Demos Section at <http://www.thewirelessfaq.com/demos.asp>.

The application will generate a card that contains one variable called **a** which contains the specified number of the character **x**. You can choose between sending this variable to the server using GET or POST. After sending the data, the script will display the number of bytes it received and the content type of the data it received.

The script generated deck that is used to send the data to the server in the above test application looks exactly like this, except that where it says "GET" it will say "POST" if you've chosen to POST, and the number of X's will reflect the number of bytes you specified:

```
>
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
```




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7.15 Can color images be used in WAP?

At present, there is only one browser that accepts color images, and that is [Openwave.com](http://openwave.com)'s UP.browser version 3.2. Currently this browser is only in one cellular phone, the [Hitachi C309H](http://hitachi.com), and at time of writing this phone has not been released on the market.

Since WBMP images are monochrome, Openwave.com has wisely chosen the very popular PNG, Portable Network Graphics format for color images. The format of PNG images is described in [RFC-2083](http://rfc2083.org) and most good graphics packages fully support the format, including command line tools and libraries for most operating systems if you're thinking about generating dynamic images.

Openwave.com has released an SDK, version 3.3, to emulate this browser, and that is available at http://developer.openwave.com/dev/ts/ja/license_32j.asp after [registering](#). Note that there are a few limitations to this SDK. It's more of a HDML browser with WML and PNG capabilities.

Unfortunately all Openwave.com's web documentation on the SDK 3.3 is in Japanese.

The WAPCAM available for WML browsers at <http://allnetdevices.com/faq/wapcam.php3>, supports the new color image format. After downloading installing the SDK, simply paste the URL above into the emulator and have a look.

To use PNG images in your code, simply point to the image file the same way you point to a WBMP image:

```

```

Most good web server are already configured to handle the [MIME type](#) of the PNG images, but if it isn't, the MIME type is simply `image/png`.

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WAP 2.0, XHTML, IOT, OTA, WML.....
WMLProgramming is "the" list!

The Wireless FAQ

7.16 How does Nokia's "Use Number" function work?

Browsers that support all or parts of the so called WTAI specifications have a function that lets you link to a telephone number. The function is explained [here](#).

At the time of writing, no Nokia phone have browsers that support WTAI, and although this is likely to change, there is currently no way of linking to a telephone number in the same way WTAI supports. Instead, the Nokia browser has a "Use Number" function which basically scans through the current WML deck looking for something that resembles numbers which it displays in a list. The number can then be dialed by pressing the "Off hook" button.

In some cases this function is a bit tricky to incorporate into a WML deck, especially if you want to use the same deck for browsers that support this WTAI function, and those that don't. A method of presenting the number only once in a deck but still support both types of browser has not been found, instead, you will have to display the number twice, or, have the server detect if it is a WTAI compatible browser and generate a deck based on this.

It is important that you understand how numbers are recognized, and the following example should give you an idea. Note the way (some) non-numeric characters right next to numeric characters influence the recognition. Also note that the number inside the link hides the number completely.

```
<p>+1 234 567</p>
..gives "1234567"
```

```
<p>(01)234-567</p>
..gives "01234567"
```

```
<p>(01) 234-567</p>
..gives "234567"
```

```
<p><a href="call.wml">234-567<a></p>
..would not give anything at all
```

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7.17 What are Openwave.com WML Extensions and how do they work?

"Openwave.com WML extensions" is a superset of "normal" WML which adds a few nice features. These features are supported by UP.Browsers 4.x and later which has been adopted by the great majority of mobile phones around the world such as Motorola, Siemens, Alcatel, Philips, to name a few.

The WML Extensions were introduced because, although WML is derived from Openwave.com's HDML, some of these functions are missing. Some of these are

- Mobile-originated prefetch
- Notifications and alerts (push)
- Activities
- In-line and built-in icons
- Keyboard accelerators

When faced with the challenge of migrating existing HDML sites while safeguarding the advanced features offered by HDML, Openwave.com introduced the WML extensions. The extensions make it possible to port an existing HDML site to WML without losing features.

You can learn more about the WML Extensions from the WML 1.1 language reference that ships with the UP.SDK 4.x which also covers WML Extensions (look in **C:\Program Files\Openwave.com\UPSDK40\docs\wmlref**).

These documents can also be found on the web at: <http://developer.openwave.com/dev/ts/htmldoc/40/wmlref/>

Online versions (in HTML and PDF format) are also available on the Openwave.com Developer web site at this URL:

<http://developer.openwave.com/dev/ts/up/library.asp#manuals>.

In addition, Openwave.com publishes a cool whitepaper called: "Using WML with Openwave.com Extensions to Optimize Wireless Services" which is a "best practices" guide to using nested contexts and mobile originated pre-fetch features. You can find it here:

http://developer.openwave.com/dev/ts/technotes/wml_techniques.pdf

The following tags/elements/attributes are available in the WML Extensions:

Elements:

- <link>
- <spawn>
- <exit>
- <catch>
- <throw>

Attributes:

- accesskey (now standard in WAP 1.2)
- localsrc (technical speaking part of standard WML, but only supported by UP.Browser)

WML Extensions do however not comply with the WAP Forum's DTD. When coding with the extensions, you will need to use a different DTD, or your applications will break. The following is the correct doctype declaration you should use:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//PHONE.COM//DTD WML 1.1//EN"
"http://www.openwave.com/dtd/wml11.dtd">
```

This DTD is a superset of the standard WML 1.1 DTD. This means that you can specify this DTD even if you are serving standard WML 1.1. All WAP-compliant browsers and gateways are required to support extended DTDs. At worst, extended language elements should be passed through (unencoded) by non-Openwave.com WAP gateways, and should be ignored by non-Openwave.com WAP browsers. For the <link> element, this should have no serious side effects on applications. However, an ignored <spawn> element could result in a disabled softkey, anchor, or select option on phones that do not support the <spawn> element. Therefore applications can avoid usability problems

7.17 What are Openwave.com WML Extensions and how do they work?

by serving WML with Openwave.com extensions only to phones that are running UP.Browser 4.x and later. Applications can [check the WAP browser type](#) and version by examining the USER_AGENT header in each HTTP request to the application server.

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7.18 Can WML extensions be used in Europe and other GSM areas?

The short answer is that Openwave.com's WML Extensions can be used if you target your code for the UP.Browser version 4 or higher.

The slightly longer answer is that according to the WAP specifications, every gateway should pass unrecognized mark-up along to the browser unencoded. This has been seen to work on common gateways used by network operators in GSM areas (UP.Link, Ericsson, Nokia). If you target your application for the UP.Browser (i.e. if you use multiple version of your application), you will be able to exploit the possibilities offered by the extensions.

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Authoring for Multiple WAP devices
Absolutly NOT... OUI

The Wireless FAQ

7.19 What is WML Extension "Mobile-Originated Prefetch" (<link> tag)?

The <link> element instructs the browser to preload the next deck from the application server before the user selects the link to it. In most cases the deck is already loaded in the browser cache before the user selects the link, so that the deck is presented to the user immediately, with no perceived network latency.

The <link> element should be used only when there is a strong probability that the user will instruct the browser to load the associated URL. The down side to using mobile-originated pre-fetch is that if the user backs up and never selects the link, the download is wasted.

Example:

```
<wml>
  <head>
    <!-- Pre-fetch the next page -->
    <link href="story1b.wml" rel="next" />
  </head>
  <card title="News Service">
    <!-- Skip and Done soft keys -->
    <do type="accept" label="Skip">
      <go href="story2a.wml" />
    </do>
    <do type="options" label="Done">
      <exit />
    </do>
    <p>
      Tech Stocks Rise Again
      ...
      <!-- Link to next page at the bottom of -->
      <!-- this page -->
      <a href="story1b.wml" title="More">More...</a>
      <a href="story2a.wml" title="Skip">Skip</a>
    </p>
  </card>
</wml>
```

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7.20 What are WML Extension "nested contexts/activities" (<spawn> tag)?



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7.20 What are WML Extension "nested contexts/activities" (<spawn> tag)?

Nested contexts are similar to functions in conventional programming languages, in that they provide a protected memory space (context) for local variables. This can be very useful for protecting private user data (e.g. credit card numbers) from other WAP applications. Nested contexts also allow the history stack to be segmented, so that several cards can be popped at once (using the <exit> element). This can be useful for navigating the user out of some complex set of cards (e.g. an E-commerce input form) without forcing the user to hit the back key several times. It also allows applications to keep the history stack small, which minimizes the risk of stack overflow on memory-constrained devices.

A very comprehensive overview of nested contexts is described in the UP.SDK Developer's Guide in Chapter 2 ("Doing More with WML").

Here is an online reference to the guide on the Openwave.com Developer web site:

<http://developer.openwave.com/dev/ts/html/doc/40/devguide>

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7.21 How is the WML Extension localsrc attribute used?

The Openwave.com extended DTD allows for elements to be nested within <option> and <do> elements. This instructs the browser to display the image within the menu item or action (soft key) label, respectively.

Note that UP.Browser also supports the localsrc attribute, which allows developers to display any of a number of built-in browser icon images.

Example:

```
<card>
  <do type="accept">
    <go href="#c2"/>
    
  </do>
  <p>
    Icon menu
    <select>
      <option>
         Home
      </option>
      <option>
         Video
      </option>
    </select>
  </p>
</card>
```

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7.22 How is the "accesskey" attribute used?

On the UP.Browser, if you implement menus with the <select>/<option> construct, the browser will automatically create keyboard accelerators for your menus.

You can do the same with links if you use the "accesskey" attribute which has become standard in WAP 1.2.

In the following example, keys 1 through 8 are the keyboard accelerator which allows direct jumps to each of the anchors.

```
<p><a accesskey="1" href="http://wfaq.net/links.php3">WAP Links</a></p>
<p><a accesskey="2" href="http://wfaq.net/demos.php3">WAP Demos</a></p>
...
<p><a accesskey="8" href="http://wfaq.net/email.php3">E-Mail</a></p>
```

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Absolutly NOT... **OUI**

The Wireless FAQ

7.23 How can I tell which WML version a device supports?

Since the different WML specifications contain a large number of new/updated functionality, it's nice to know which version of WML the device you are sending WML code to supports. [James Skinner](mailto:James.Skinner@nortelnetworks.com) (James.Skinner@nortelnetworks.com) has found that devices that support WML 1.2 should (or rather must) add a version number in the so called **Accept** header send to the web server which the request. In more detail, the version number appears after string **text/vnd.wap.wml**

A WML 1.1 device will an **Accept** header looking something like this:

```
Accept: image/vnd.wap.wbmp, text/vnd.wap.wml, */*
```

..while a WML 1.2 device will send a header looking something like this:

```
Accept: image/vnd.wap.wbmp, text/vnd.wap.wml;level=1.2, */*
```

...indicating that this is a device that accepts WML 1.2 code.

The **Accept** header can be read by just about any script language, such as [PHP](#).

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The Wireless FAQ

08 - Troubleshooting

When your applications aren't working as they should, chances are that someone has already solved the problem and added the solution to this FAQ.

[8.1 Why won't my WBMP images appear?](#)

[8.2 The WAP device emulator says text/html mime type is not supported, but my MIME setup is correct?](#)

[8.3 I can't get the <input/> format to work correctly. What's wrong?](#)

[8.4 I think some special characters are breaking my code or links, what can I do?](#)

[8.5 What's the size limit on each WML deck?](#)

[8.6 I can't get POST to work! What's wrong?](#)

[8.7 My ASP code works on emulators but not on real browsers. What's wrong?](#)

[8.8 Why won't my META tags work in WML?](#)

[8.9 Why aren't the server receiving the variables I send it?](#)

[8.10 Why doesn't some Mitsubishi browsers \(Trium\) run WMLScript?](#)

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8.1 Why won't my WBMP images appear?



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8.1 Why won't my WBMP images appear?

Images are placed in the text flow by using the `` WML tag. Most commonly the problem with broken images is caused by the wrong syntax of the `` tag. The absolute minimum number of parameters for this tag is "src" and "alt". Other parameters are optional. The "src" parameter specifies the path to the image file, and the "alt" parameter specifies an alternative text string which will be displayed if the micro browser cannot display the image. Also remember that parameter values must be enclosed in double quotes.

```

```

If the decks are served by an HTTP server, the server must also be set up to handle the correct MIME type of WBMP images. The correct MIME type for WBMP's is "image/vnd.wap.wbmp".

The problem could also be caused by the image itself. The WBMP format is very limited. The maximum number of colors is 2, and the size is limited to the display of the WAP device. Some WAP Development Kits lets you use GIF images, but WAP devices supports only WBMP images.

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8.2 The WAP device emulator says text/html mime type is not supported, but my MIME setup is correct?



The Wireless FAQ

8.2 The WAP device emulator says text/html mime type is not supported, but my MIME setup is correct?

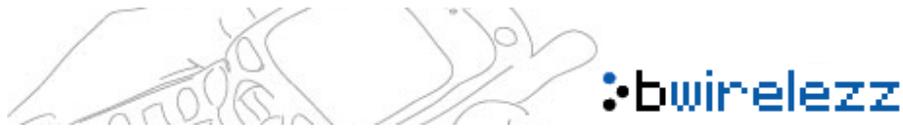
When using server side scripting languages such as ASP, PHP or Perl to produce WML output, or when serving WML decks off an HTTP server, remember that the HTTP server is usually set up to display HTML by default, i.e. in MIME type text/html.

If your HTTP server or server side script processor fails with an error message, the error message, will most likely be presented in HTML format, and the micro browser will fail to display it.

A developer kit/emulator will usually have some way of letting you view the code that it received from the HTTP server. For instance, in the Nokia SDK, this function is called View Source. By viewing the source you will see exactly what the HTTP server sent you, and you should be able to view any HTML formatted error messages. You could also connect to the URL using a normal HTML based browser to view the error message.

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8.3 I can't get the <input/> format to work correctly. What's wrong?

At least the Nokia WML Reference docs are a bit unclear on the use of the format parameter in the <input/> tag. The format parameter controls the type and format of characters the user is allowed to input.

Note that not all WAP 1.1 browsers accept all formatting codes. The Nokia 7110 for instance has very poor support. The Mitsubishi Trium has a slight problem with the *f code, where * must 1 or greater.

The formatting codes specify the following

- **A** means any uppercase alphabetic (non numeric) or punctuation characters
- **a** means any lowercase alphabetic (non numeric) or punctuation characters
- **N** means any numeric character
- **X** means any uppercase character
- **x** means any lowercase character
- **M** means any character, input mode starts in uppercase mode
- **m** means any character, input mode starts in lowercase mode
- ***f** (asterisk) means any number of (including 0) characters, where f is a format code
- **nf** means exactly n number (1-9) of characters, where f is a format code
- **** is used for displaying (escaping) non formatting codes in the input string

The formatting characters can also be combined to force a certain type of input, however forcing a certain input should be avoided since there is no error messages when the user attempts to input an incorrect format. If the input is incorrect, the field might on some browsers simply remain blank. At least let the user know what to type. Also remember to help the user as much as possible. If you only want numeric input, use the "*N" format which will switch the input mode to numeric input. If you only want uppercase characters, use the "*M" format to switch to uppercase input.

Some examples:

```
"N" means that you will only accept one single numeric character
"*N" means that you will accept any number of numeric characters
"NN" means that you will only accept two numeric digits. No more, no less
"ANN" means that you will accept any single uppercase alphabetic (non numeric)
character, followed by two digits. No more, no less
"X*N" means that you will accept any single alphabetic (non numeric) character,
followed by any number of numeric digits
"*M" means that you will accept any number of any characters (numeric and non
numeric), and the input mode will start in uppercase
"NNN\ -NNN\ -NNNN" means that you will accept a US type phone number format, eg.
"123-456-1234"
"2N\ :2N\ :2N" means that you will accept a typical time format, eg. "12:02:34"
"NNNNNNNNNN" means you will accept a 9 digit number
"9N" means you will accept a 9 digit number
```

The maxlength parameter can be used to control the number of characters you want the user to input.

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8.4 I think some special characters are breaking my code or links, what can I do?

Anchors/links sometimes contain other characters than A-Z and 0-9. Typical special characters are ~ (tilde) and & (ampersand). If you're coding "by the book", you should tell the WAP browser which character set you are using. This is done in the XML definition at the start of every deck such as this:

```
<?xml version="1.0" encoding="iso-8859-1"?>
```

"iso-8859-1" is the real name of the Latin1 character set. This should in most cases give you what you want. However, its common to escape ALL escape-able characters. Even if you have specified the character set - but you will find that it's probably not necessary.

Character entities are "standardized" names for certain special characters, for instance the & (ampersand) character with "&". For a complete list of such character and their character entities, see the [Character Entity Reference Chart](#)

Note that at present it seems that most browsers have problems decoding the actual name of the entity (HTML4 entities). For instance, Nokia lists compatibility with only seven entity names, "quot", "amp", "apos", "lt", "gt", "nbsp" and "shy". However, the browser can display almost all the characters, but only by using their decimal code (which is available in the link above). Nokia's browsers actually crash if they receive an entity name it does not support.

By using a HTML or WML capable browser (although not very pretty in HTML format :-), you can access an online entity name listing at <http://wap.colorline.no/wap-faq/apps/charentref.asp>. The table is also reachable from the example applications list at <http://www.thewirelessfaq.com/demos.asp>

The first section will let you choose which set of characters to display, Latin1, Latin1 Mathematical and Greek symbols, and finally the Latin1 Markup symbols. Notice that the lists are split up because of the size of the decks they produce. The actual list shows the entity name, the entity's decimal number and the actual symbol. From that you should be able to tell which symbols a given browser can display.

Note that the above online list does not set the "charset=iso-8859-1" (Latin1's real name) XML definition.

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8.5 What's the size limit on each WML deck?

Due to the fact that WAP devices have very little memory, there is a limit to how big each WML deck can be. To make things interesting, there is no standardized limit, so it varies from browser to browser. The list below shows the limits on some browsers.

Note that these limits note the size of the WML deck in its tokenized/compiled/binary form, in other words not the plain text XML code that you most likely send out from your server, but the compiled form which the gateway passed along to the WAP device. An uncompiled WML deck can be quite large, and then end up as a fairly small compiled deck once it passes through the gateway.

Browser	Compiled WML deck limit
UP.Browser 3.2	1492 bytes
UP.Browser 4.x	2048 bytes
Ericsson R320	Aprox 3000 bytes
Ericsson R380	Aprox 3500 bytes
Ericsson MC218	More than 8000 bytes
Nokia 7110	1397 bytes

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8.6 I can't get POST to work! What's wrong?

There have been many rumours that POSTed variables in many cases get lost, especially from the Nokia 7110. As far as we know, there are no versions of the Nokia 7110 that have problems with using POSTed variables. The problem lies in the gateway(s) and/or the receiving end, i.e. the script or whatever is reading the data from the client side.

Tests have shown that the Nokia SDK 2.18 have problems using POSTed variables when using the built-in gateway (the gray window on the right side of the screen). Even when the **method** is set to "post" the server side reads the posting as a request, i.e. as a **GET**. This can be tested by using the simple WML deck located at <http://allnetdevices.com/faq/apps/posttest.wml> which is also available from the WAP/WML FAQ Demos Section at <http://www.thewirelessfaq.com/demos.asp>. The Nokia SDK will also usually corrupt the URL for the POST. In some cases the last character of the URL will be removed.

The Post Test deck will simply post two variables called "var1" and "var2" to a script that will display the contents of the variables and the full HTTP header contents. If you cannot see the correct contents in the variables, something went wrong. Check the HTTP header for the string **application/x-www-form-urlencoded**. (Note! You need to input something into the variables to actually see any content of course)

The way to solve the problem with the Nokia SDK 2.18, is to configure it to use any of the publicly available WAP gateways. A list is available [here](#). I recommend using the [wapHQ](#) gateway.

In other cases where POSTing does not seem to work, the problem might be with how the HTTP headers are parsed on the server side. Script languages such as ASP and Java, and also CGI's typically look for an exact match of the string **application/x-www-form-urlencoded** in the HTTP header. In some cases the string might have additional data appended, such as **charset="utf8"** which describes which character set the POSTed data is in. Since the server side does an exact match, it will not see the HTTP header, and the POSTed variables are lost.

Note that this is **not** the browsers fault. Adding the character set info is allowed in HTTP. The script language is the guilty party.

To check if this is a problem with the browser/gateway combination you are using, the same Post Test deck as above can be used. Again look for the string **application/x-www-form-urlencoded** in the output, and check if there is any additional characters appended to the end of it. If there is, chances are that your server side application does not see the header.

The solution to this problem is more difficult, and it varies between the different script languages, and in the case where a CGI is used, you'll need access to the source code. In short, the solution is to read the HTTP header manually, i.e. not using the prewritten commands of your script language to do it.

If you discover this problem with your browser/gateway combination, please mail [Ed Alkema](#) with a description of which browser and gateway is being used. If you in addition already have a solution, we'll present it in this FAQ.

And here is one solution to the problem with ASP submitted by [Luca Passani](#). It shows how to grab the data that was sent as a POSTing from the browser as binary data. You'll need to parse the binary data to find the variables you need.

```
Dim lngTotalByteCount
Dim vntRequestData
lngTotalByteCount = Request.TotalBytes
vntRequestData = Request.BinaryRead(lngTotalByteCount)
```

Turned into actual code, it would look something like this which [Gaddo F. Benedetti](#) (gaddo@gaddo.net) kindly submitted.

```
<%@ Language=VBScript %>
<%
    Dim Temp, i, sPost, sWMLDeck

    'Converts the binary data to a string.
    For i = 1 To Request.TotalBytes
        Temp = Request.BinaryRead(1)
        sPost = sPost & Chr(AscB(Temp))
```

8.6 I can't get POST to work! What's wrong?

Next

```
'Parses out the values of the POSTED variables (in this
'example myvar1 and myvar2).
Dim sVar1, sVar2
sVar1 = getVar("myvar1", sPost)
sVar2 = getVar("myvar2", sPost)

'Writes the WML Deck displaying the POSTED Variables
sWMLDeck = "<?xml version="1.0"?>" & vbCrLf
sWMLDeck = sWMLDeck & "<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN" "
sWMLDeck = sWMLDeck & "\"http://www.wapforum.org/DTD/wml_1.1.xml\">" & vbCrLf
sWMLDeck = sWMLDeck & vbCrLf & "<wml>" & vbCrLf & vbTab
sWMLDeck = sWMLDeck & "<card id="main" title="POST TEST">" & vbCrLf
sWMLDeck = sWMLDeck & vbTab & vbTab & "<p>" & vbCrLf
sWMLDeck = sWMLDeck & vbTab & vbTab & vbTab & "myVar1: " & sVar1 & "<br/>" & vbCrLf
sWMLDeck = sWMLDeck & vbTab & vbTab & vbTab & "myVar2: " & sVar2 & vbCrLf
sWMLDeck = sWMLDeck & vbTab & vbTab & "</p>" & vbCrLf & vbTab
sWMLDeck = sWMLDeck & "</card>" & vbCrLf & ">/wml>"

Response.ContentType = "text/vnd.wap.wml"
Response.Write(sWMLDeck)

'Quick function for picking out the values of the POSTed variables.
'sKey is the variable name, sRaw is the POST string.
Private Function getVar(sKey, sRaw)
    Dim sRetVal
    If InStr(sRaw, sKey) Then
        sRetVal = Mid(sRaw, InStr(sRaw, sKey) + Len(sKey) + 1)
        If InStr(sRetVal, "&") Then
            sRetVal = Mid(sRetVal, 1, InStr(sRetVal, "&") - 1)
        End If
    End If
    getVar = sRetVal
End Function
%>
```

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8.7 My ASP code works on emulators but not on real browsers. What's wrong?

In most cases emulators are not as strict as real WML browsers. This is especially true for those emulators that do not use real gateways (Nokia SDK/Toolkit), or those that do not use gateways at all (WinWAP, WapMAN).

A real WML browser can only read the binary, tokenized form of WML, WMLC, and for the gateway to be able to convert/compile the textual WML code into WMLC, the syntax has been made very strict. ASP is designed for HTML browser, and HTML is nowhere near as strict as WML.

There is a slight "bug" in ASP that makes it output whitespaces (such as spaces, carriage returns and line feeds) in places where WML says there cannot be any. Note that some gateways fix the problem by not passing the whitespaces through (CMG Gateway for instance).

The following is a couple of lines of ASP code that usually starts the WML deck to send out MIME types etc:

```
<%Response.ContentType = "text/vnd.wap.wml"%>
<?xml version="1.0"?>
```

The problem with the code above is that ASP will output the carriage return/linefeed between `.wml"%>` and `<?xml vers`. The two lines are after all separated by a carriage return/linefeed. This will break the WML code because the absolute first character in a WML deck **must** be the `<` that starts the line `<?xml version="1.0"?>`. With the code above, the WML deck starts with a carriage return/line feed.

The way to solve the problem is simply to put the two lines on the same line of code, like this:

```
<%Response.ContentType = "text/vnd.wap.wml"%><?xml version="1.0"?>
```

After the XML definition is correctly formatted, WML is not that strict when it comes to whitespaces.

Also note that some gateways have issues with content switching in ASP. Thus it is wiser to use **Response.Write** to produce output, rather than using `<%=MyVar%>` in the middle of your straight WML code.

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8.8 Why won't my META tags work in WML?

By default, meta tags like `<meta http-equiv="refresh" content="1;http://somewhere.com/">` are not supported by WML browsers.

A very few gateways do however support a very limited subset of META tags, but tests show that if you need to use them, there's something wrong with the gateway. For instance, one gateway does not support normal bog standard HTTP cache control, and the only way to control its cache is to use special META tags. Obviously, a user coming in from another gateway would not be able to use the same code.

Bottom line: don't use META tags. There's bound to be a proper way of doing what you want.

The most commonly attempted META tag is the `<meta http-equiv="refresh" content="1;http://somewhere.com/">` that tells the browser to load the specified URL after a certain time has passed. WML already contains a tag for this called `<ontimer>`

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8.9 Why aren't the server receiving the variables I send it?

Variables from user input or other can be sent to the server the same way as it would be done in the HTML world. That is, from a **<FORM>** either by a POST or a GET.

It is important to have at least some understanding of the difference between a POST and a GET. For POSTs, the browser generates a block of data containing the variable names and their content which it sends to the server. For GETs, which are really just a normal request for a URL, the variable names and contents are located in the URL itself.

For POST specific problems, also check [this](#).

As the WAP environment is very strict, it is important to follow the standards. Although the following URL will work in most HTML environments

```
"/cgi-bin/somescript?username=john&telephone=123-123-1234&occupation=banana+bender"
```

the same URL in the WAP environment will not work. The line above is partially encoded to protect the variable contents from being incorrectly translated. Specifically the whitespace between **banana** and **bender**. URLs can after all not contain any whitespaces.

The reason why the line above won't work in WAP is that the **&** ampersand that separate each variable and variable content pair is not escaped/encoded. The correct format of the above line should be

```
"/cgi-bin/somescript?username=john&amp;telephone=123-123-1234&amp;occupation=banana+bender"
```

where the **&** is replaced by its [Character Entity](#).

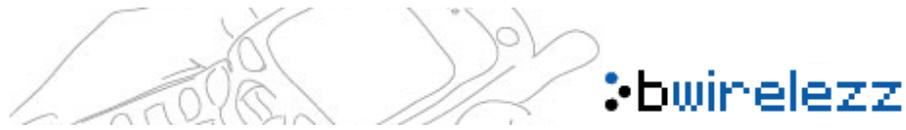
Just to illustrate even further, here's some WML code.

```
<card id="input" title="Gimme some data">
  <p><input type="text" name="username" format="M*m" /></p>
  <p><input type="text" name="occupation" format="M*m" /></p>
  <p><anchor>Send this<go
href="/cgi-bin/somescript?username=$(username)&amp;occupation=$(occupation)"/></anchor></p>
```

Note that this isn't really WAP specific. Special characters should always be encoded/escaped or you might get unpredictable results.

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8.10 Why doesn't some Mitsubishi browsers (Trium) run WMLScript?

The Mitsubishi Trium can actually run WMLScript, but the browser has an option that allows the user to disable the execution of WMLScript. Almost like a HTML browser has an option to disable execution of Java and JavaScript.

There's only one problem with this feature, and that is that the browser will still say it accepts WMLScript even though the execution is disabled.

If someone can come up with a good way of reliably checking that a browser can actually run WMLScript please mail [Ed Alkema](#) and it will be happily received by a large group of WAP developers jumping for joy!

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Authoring for Multiple WAP devices
Absolutely NOT.... OUI

The Wireless FAQ

8.11 Why is the REFERER line in the HTTP header not visible?

When a HTML browser moves from one URL to another, it by default sends a HTTP header line called **Referer** to the server telling it which URL the browser requested before requesting the current location (the referring page). A very useful feature indeed, and the same functionality is available in the WAP environment, but since this information has to come from the user agent, the wap device, it is usually disabled to save bandwidth and time.

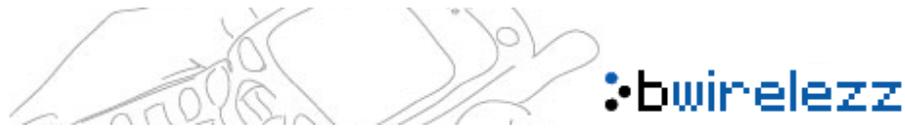
To enable the **Referer** the tags that makes the browser request a new URL such as `<a>`, `<go>`, etc takes a parameter called **sendreferer**.

```
<go href="/somedir/somedeck.wml" sendreferer="true"/>
```

..will ship the referring URL with the request for the `/somedir/somedeck.wml` request. The referer url can be read by any proper server side script language.

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8.12 Why does a normal HTTP 302 redirect not work with WAP?

The truth is that it does. The crucial detail is the server side script language, or rather the interaction between the server side script language and the web server.

The so called **302 Found** HTTP response basically means that the web server tells the user agent that the resource may be found elsewhere, temporarily. All web servers I have tested so far add a **Content-type:** to the response even if there is no content. By default the **Content-type:** is in normal circumstances **text/html**.

Actually, the HTTP specifications on "[302 Found](#)" say that the web server, unless the request method was HEAD and not GET, should also send a body containing a short message for the (human) user saying that the location has changed. In WML's case, the short message must obviously be a full WML deck with one card. If the gateway/browser fully supports a redirect, the message will not be shown. If it doesn't, the user will have to manually follow the link to the new location. **This is crucial** if your script may output any characters, either on purpose or by mistake. ASP is famous for outputting whitespaces where there should be none. This doesn't cause a problem for a HTML browser, but will certainly do so for a WML browser.

Note that none of the examples below contain a body - just the header.

Thanks to [Al Sutton](#), [John McAleely](#) and [Patrice Slupowski](#), the following code examples have been tested and found to work on [Apache](#) and [Microsoft Internet Information Server](#). If you use another web server or another script language, you should be able to convert these rather simple script snippets. And the keyword is **simple**. No need to tell the web server to generate a full HTTP header unless you need to. Most web servers will complement the header so that the user agent understands it. This is just to override what's absolutely required as a minimum.

All code examples are available for testing online. If they work, you will be redirected to <http://allnetdevices.com/faq/clientinfo.php3> which generates a WML deck with a card that displays all HTTP headers.

PHP code example which can be tested at <http://allnetdevices.com/faq/apps/302test.php3>:

```
<?
  header( "Location: http://wfaq.net/clientinfo.asp" );
  header( "Content-type: text/vnd.wap.wml" );
?>
```

Perl code example which can be tested at <http://wap.colorline.no/cgi-bin/302test.pl>:

```
print "Location: http://wfaq.net/clientinfo.asp\n";
print "Content-type: text/vnd.wap.wml\n";
```

[James Skinner](#) (James.Skinner@nortelnetworks.com) adds that with Perl you can use the No-Parsed-headers option which will produce the complete HTTP response so that the web server does not have to:

```
#!/usr/local/bin/perl

use CGI qw(:standard);

print redirect(-uri=>'http://james.istop.com/redirected.wml', -nph=>1);
```

This requires informing the web server that the script is a nph script (on Unix you rename the script to start with nph- on NT IIS figures this out by itself)

ASP code example which can be tested at <http://194.143.2.94/302test.asp> (note different URL):

```
<%
  Response.Redirect( "http://wfaq.net/clientinfo.asp" )
  Response.ContentType = "text/vnd.wap.wml"
```

8.12 Why does a normal HTTP 302 redirect not work with WAP?

```
Response.Flush  
Response.End  
%>
```

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WAP 2.0, XHTML, IOT, OTA, WML.....
WMLProgramming is "the" list!

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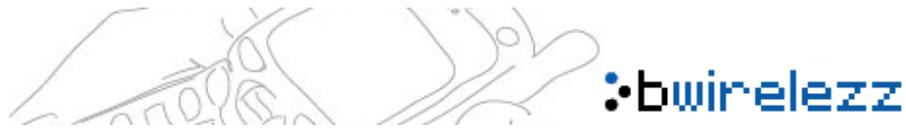
8.13 Why won't the Nokia 7110 POST more than 160 characters?

Some versions of the Nokia 7110 browser has a problem with POSTing more than around 160 characters. In reality, there seems to be a content length limit of around 170-180 characters. In other words, the variable names and their contents all put together. if you only post one variable called "A", then this variable can hold around 160 characters. If you have several variables, with names like "thisisthenameofaverylongvariable", then the contents of these variables have to be smaller.

There is however a solution to this problem, but it requires the phone to be reconfigured. Under the *Connection Settings* menu, you will find a menu item called *Connetion type*. If you set this to *Continous* the phone will be able to post larger variable contents.

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8.14 Why can't I pass variables with spaces and apostrophes?

To pass variable names and content to the server, you might do something like this:

```
<go href="/cgi-bin/somescript?name=$(name)&age=$(age)"/>
```

If the user inputs a **name** string that contains special characters such as a spaces or apostrophes, it will result in an illegal URL. If the user typed "**Espen Lyngaas**" and **I'm 32 years old**, the URL would be:

```
/cgi-bin/somescript?name="Espen Lyngaas"&age=I'm 32 years old
```

The server that receives this URL is unlikely to accept that. The solution to the problem is to enable so called character escaping when the variable is replaced. The general syntax is **\$(variablename:escapemode)** where **variablename** is the name of the variable and **escapemode** is **noesc** which means do not escape or unescape the variable, **escape** which means that the variable should be escaped, and **unescape** which means that the variable should be converted from an escaped format to a normal format. The following will solve the above problem:

```
<go href="/cgi-bin/somescript?name=$(name:escape)&age=$(age:escape)"/>
```

This will produce an URL like this:

```
/cgi-bin/somescript?name=%22Espen+Lyngaas%22&age=I%27m+32+years+old
```

Escaping can be used wherever variable replacement is used in the WML code, for instance **<setvar name="var1" value="\$(myname:escape)">**.

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The Wireless FAQ

8.15 I can't display a dollar sign in my WML code, what's wrong?

The dollar sign \$ in WML is a reserved character for use with variable replacement. To display a dollar sign, simply use two dollar signs, like this:

```
<p>Your total phone bill for today is $$ 9934.87 plus VAT</p>
```

This will display **Your total phone bill for today is \$ 9934.78 plus VAT**

[[Main](#)] [[08 - Troubleshooting](#)]

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The Wireless FAQ

8.16 My WAP services only works for me, no one else! What is wrong?

Although this might seem like a complex or very general problem with many solutions, in most cases it's easily solved by eliminating possible causes. First of all make absolutely sure that your WML code is correct. Use a very simple WML deck to do this, something like below that every browser will render without any problem.

```
<?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="test">
    <p>Hello world</p>
  </card>
</wml>
```

If that doesn't work, check that the web server you are using is configured for the correct [MIME types](#). Because the deck works for you, this is most likely not the problem, but some emulators will actually render decks even though the emulator received an incorrect MIME type. To verify that the MIME type is correctly configured, simply use Netscape or Internet Explorer and point to the URL where the deck is. Netscape and Internet Explorer will of course not be able to display the deck correctly, but both will tell you that they have received data of type **text/vnd.wap.wml**. If they do, the MIME types are configured correctly.

The next step is to verify that people on the internet can actually reach your web server. Figure out where your web server is located. If you're at work, your employer might have a firewall in place that prevents people on the internet to access it, while you, as an employee, will be able to access. Get someone on a completely different network somewhere on the internet to access the URL, preferably with Netscape or Internet Explorer and see what happens. HTML-browsers are a bit better at giving an understandable error message than WML browsers.

If others can reach the URL via Netscape or Internet Explorer, then there is most likely something wrong with the way WAP clients access the service. In the cases where it doesn't work, the user may be connected to a so called "walled garden" operator which means that the operator only allows its users to access a preset list of sites. If this is the case, the user should quickly switch to another operator - at least in my opinion. If you've narrowed it down to a problem with the operator or its WAP gateway, there's not much more you can do except get other users, connected to other operators and other WAP gateways. If it works for them, you are pretty sure of where the problem is. One word of caution - if you go as far as to contact the operator or the owner of the gateway, please please please be 100.00% sure that the problem isn't caused by anything on your side.

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Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

09 - Security

Details on one of the most discussed Wireless Application Protocol topics. WTLS, SSL, restricting access and so on.

[9.1 How can I protect certain WML pages/decks from unwanted users?](#)

[9.2 Are Sessions supported in the WAP environment?](#)

[9.3 Are Cookies supported in the WAP environment?](#)

[9.4 How secure is WAP with SSL and WTLS?](#)

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9.1 How can I protect certain WML pages/decks from unwanted users?



The Wireless FAQ

9.1 How can I protect certain WML pages/decks from unwanted users?

The WAP environment partially supports the protection of certain directories and files (and even commands) through the HTTP protocol. The system is identical to what you would use on a normal web page, and is known as Basic Authentication.

Note that some WAP emulators and virtual WAP browsers might not support this feature.

At this time it is not know if it is possible to use other types of authentication.

To enable this feature your HTTP server must support it, and most of them do. When a WAP browser requests a certain URL, it will prompt the user for a username and password. Both are lightly encoded to pad the characters, but not encrypted, which means that anyone "listening" in on the network with the right equipment can see your username and password.

The feature is well documented in the Apache distribution, but for the documentationally impaired, here's how to configure this on an [Apache](#) HTTP server:

Make sure that Apache is configured so that so called **.htaccess** files can override the global access settings. Access settings can be done in both separate files for each directory, or in the global **access.conf** file, but in this example we'll concentrate on the use of the **.htaccess** file. Located and edit the **access.conf** file and check the value for the **AllowOverride** setting. This should be set to **AuthConfig** which means that when Apache finds a **.htaccess** file in a directory, it will apply the access rules found in the file to that directory. Remember to reload Apache after changing the settings.

Next place a file in the directory you want to protect called **.htaccess**. (*Note the dot at the start of the filename*). The contents of a basic **.htaccess** file should be something like this:

```
AuthType Basic
AuthName "WAP FAQ Authentication Demo"
AuthUserFile /home/httpd/passwd/auth.passwd
require valid-user
```

The **AuthType** setting specifies the type of authentication, the **AuthName** specifies the realm, the **AuthUserFile** specifies the path to a password file, and the **require** setting specifies what is needed to gain access. In this case, any user present in the password file with the correct password.

Now you need to generate a password file, and since it's in a special format, Apache comes with a program called **htpasswd** to do this. Run the program like this:

```
# htpasswd /home/httpd/passwd/auth.passwd demo
New password:
Re-type password:
Adding password for user demo
```

NOTE! You must add the **-c** option to **htpasswd** the first time you create the file. Run **htpasswd** without any options to see the syntax.

You have now added a user called "demo" and typed in his password twice. Note that for security reasons, password files should NOT be placed below the document root like I've done in this example.

Now for the final part of testing, which I suggest you do with a HTML capable browser. Type in the URL for the directory you have protected, and a dialog box asking for username and password should appear. You are now ready to test with a WAP browser.

An example protected directory is available on this server for both HTML and WML browsers. The username for this is "demo" and the password is "demo".

This example is also available at the much-easier-to-type URL of <http://www.thewirelessfaq.com/demos.asp>

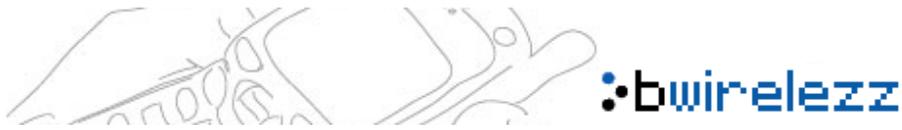
Or, you can just click [here for the protected area](http://allnetdevices.com/faq/extras/auth/) (http://allnetdevices.com/faq/extras/auth/)

and click [here to see the .htaccess file](#) used in this example (Note that this file has another name for example purposes). Finally click [here to see the contents of the password file](#) used in this example

9.1 How can I protect certain WML pages/decks from unwanted users?

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9.2 Are Sessions supported in the WAP environment?

A common way of "handling" users in the HTML world is to assign a "session" to each user. This is sometimes done by assigning a unique identifier to each user through Cookies. Since the WAP environment has very limited support for cookies, sessions must be handled differently.

[Alex Kriegel](#) provides a Custom Session Object package hosted at the excellent [WAPlinks](#) site. The zip file contains a VB Class file and the compiled DLL. Documentation is also included. The archive is available for download at <http://www.waplinks.com/customsessionobject.zip>.

Another way of doing it is by the use of [PHPLib](#) for the very popular [PHP](#) script language. [Tarique](#) (tarique@nagpur.dot.net.in) has provided the following excellent example on how to use PHPLib for authenticating and handling WAP users. Documentation is provided, and the code is commented. The archive is hosted at this site and available for download at http://allnetdevices.com/faq/extras/phplib_wml.zip.

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Authoring for Multiple WAP devices

Absolutely NOT... OUI

The Wireless FAQ

9.3 Are Cookies supported in the WAP environment?

Normal HTTP Cookies ARE to some extent supported in the WAP environment. It doesn't matter what you've heard before. Cookie support is getting better. In fact [Openwave.com](http://openwave.com)'s UP.Link gateway has had support for this for some time.

To test Cookie-support you can use the script located at http://allnetdevices.com/faq/apps/cookie_test.php3. The script is also available in the demos section at <http://www.thewirelessfaq.com/demos.asp>.

The first time you view the card, the counter should read 0 (zero). All caching has been turned off, and to support even the poorest of the WML browsers, the card forces a reload of itself by adding a random variable to the URL. (I do **not** recommend this method of forcing a reload). When you click on the Increase Counter link, the deck will reload, and the card should reappear with the counter increased to 1 (one) and so on.

The Cookie name in the script is called **TestCookie**, and it has a very long life span, so if you return to the script several days later, the counter should read the number you last saw - i.e. not 0 (zero). This only applies if you return with the same type of environment that you last visited the script with. If you somehow clear your locally stored cookie data, the counter will again start at 0 (zero).

If the counter reads 0 (zero) over and over again, a cookie is not passed to the web server. The script also attempts to check if a cookie was passed and will tell you this.

In addition, the script also displays the HTTP header string **HTTP_VIA** and **HTTP_USER_AGENT** which should give you some indication as to which gateway make and model you are using. Some gateways identifies themselves via **HTTP_VIA** and some via **HTTP_USER_AGENT** and some gateways are made by programmers that just couldn't be bothered.

The code for the test script is available below. This is PHP code, but a standard PHP `setcookie()` function equivalent will exist in most popular script languages, and that's pretty much the only special thing with the script. The function simply sets the cookie, and the PHP variable `$HTTP_COOKIE_VARS` is used to read the cookie.

```
<?
if(isset($HTTP_COOKIE_VARS["TestCookie"])) {           // Check if TestCookie is
set
    $cookieset = "set";
    $cookieid = $HTTP_COOKIE_VARS["TestCookie"];      // Read the Cookie
    $cookieid++;                                     // and increase its value
}
else {
    $cookieset = "not set";                           // cookie was not set
    $cookieid = 0;                                    // start counter at zero
}

setcookie("TestCookie",$cookieid);                   // apply the Cookie to the
HTTP header

header("Content-type: text/vnd.wap.wml");             // set the content type
for WML
header("Expires: Mon, 26 Jul 1997 05:00:00 GMT");    //
disable ALL caching
header("Last-Modified: " . gmdate("D, d M Y H:i:s") . " GMT");
header("Cache-Control: no-cache, must-revalidate");
header("Pragma: no-cache");
echo("<?xml version=\"1.0\"?>\n");
echo("<!DOCTYPE wml PUBLIC \"-//WAPFORUM//DTD WML 1.1//EN\"
\"http://www.wapforum.org/DTD/wml_1.1.xml\">\n\n");
echo("<!-- This application attempts to test the capabilities of a WAP gateway to
support cookies -->\n");
echo("<!-- App by Espen.Lyngaas@colorline.no (c) 2000 -->\n");
```

9.3 Are Cookies supported in the WAP environment?

```
$random = mt_rand(100000,999999); // Generate random value
for reload forcing

?>

<wml>
<head>
<meta forua="true" http-equiv="Cache-Control" content="must-revalidate"/> // Even
more cache disabling
</head>
<card id="init" title="CookieTest">
<p>Cookie "TestCookie" was <?echo($cookieset)?>. Value is currently
"<?echo($cookieid)?>"</p>
<p><anchor>Increase value<go method="get "
href="<?echo($PHP_SELF)?>?random=<?echo($random)?>" /></anchor></p>
<p>Gateway:
<?
    if(isset($HTTP_VIA)) { // Is there something in the HTTP_VIA
variable?
        echo($HTTP_VIA);
    }
    else {
        if(isset($HTTP_USER_AGENT)) { // Is there something in the
HTTP_USER_AGENT variable?
            echo($HTTP_USER_AGENT);
        }
        else {
            echo("Unknown"); // Absolutely no identifier was found
        }
    }
}
?>
</p>
</card>
</wml>
```

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9.4 How secure is WAP with SSL and WTLS?

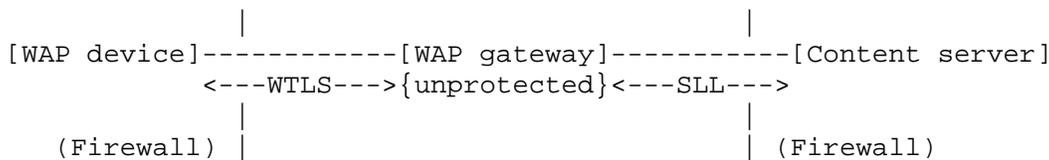
A more detailed section on the use of WTLS and SSL in relation to WAP is being written.

SSL or Secure Sockets Layer which is widely used in the "web" world to encrypt the data stream between the browser and the web server is actually also used in the WAP environment. However, SSL is only used between the web server and the WAP gateway. Between the WAP gateway and the WAP device, a similar system called WTLS or Wireless Transport Layer Security. WTLS is specialized for the wireless environment.

Security is a touchy subject. Although **no** systems are totally secure, SSL and WTLS on their own in my humble opinion provide adequate security for most applications. However, there is a potential security problem where the two protocols meet, and that's inside the WAP gateway.

SSL is not directly compatible with WTLS, so the WAP gateway must decrypt the SSL protected data stream coming from the web server and then re-encrypt it using WTLS before passing the data on to the WAP device. Inside the memory of the WAP gateway, the data is unprotected.

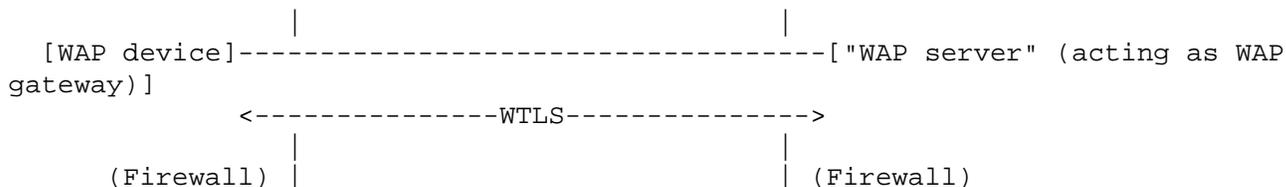
This is the current model:



Imagine if your bank or other institution dealing with sensitive data make public a WAP service. When the data leaves the security of your system and your network they are reasonably well protected. Then, when they enter the WAP gateway which is commonly owned and operated by a third party such as a mobile operator, the data is decrypted. I'm not saying all mobile operators are potential security risks, trusting sensitive data to an unknown third party is hardly a good idea. The mobile operator in question could be any mobile operator in the world. Your customer might be on vacation in some country where security is considered a trivial matter. If the mobile operator's networks are vulnerable to attacks, so are your data.

All the major WAP players are developing solutions to this problem, but for now these solutions create other problems. Developers of so called "WAP servers", or web servers with WAP gateway capabilities provide end-to-end security in a way because the data stream leaves the content server (the "WAP server") already encrypted with WTLS.

The model then looks like this:



However, the mobile operator's WAP gateway can now no longer be part of the chain, and the user has to reconfigure his WAP device to point to the "WAP server" which will become the WAP gateway for this session. But, this WAP gateway only provides access to this one service, and when the user wants to access his other favorite WAP sites, he has to reconfigure his phone again. Some WAP devices are fairly easy to reconfigure for someone with who can be bothered to read a manual, but some WAP devices are extremely difficult to reconfigure.

Adding to this problem is the fact that many mobile operators place their Point-to-Point service where the mobile device dials in to get on the internet, and their WAP gateway on the same private IP range network, usually behind a firewall. This firewall is usually set up only to allow the HTTP protocol on port 80 which is default for this protocol. The WAP gateway uses this port to receive data from content servers on the internet, and that's all it really needs. When the WAP device attempts to access another WAP gateway on the internet, the firewall will stop them either because the firewall says that the IP address of the WAP device is not allowed to route data on to the internet, or that it cannot open the ports it requires. This effectively stops the user from using other gateways that the one provided by the mobile operator.

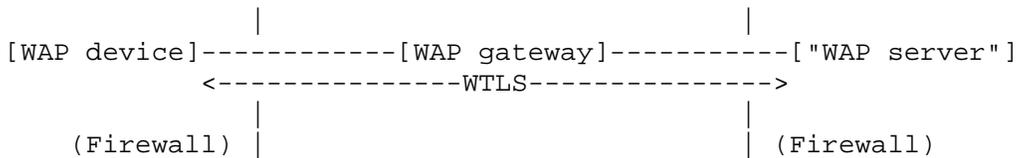
9.4 How secure is WAP with SSL and WTLS?

There are lots of people suggesting solutions to this problem, and the rumours say that upcoming versions of WAP will have a solution. Until then, at least sit down and think through what you are about to do. In my opinion there are far easier ways of getting hold of someone's credit card number, name **and** signature than hacking into a WAP gateway.

If I might make a suggestion myself, it would be to make WAP gateways accept already WTLS encrypted data streams and simply pass them along to the browser untouched. This would cause the least amount of problems for the consumer. It's easier to upgrade all WAP gateways than all WAP devices. The third party's gateway (for instance the mobile operator) would then just be a relay for the data stream as it is already protected by WTLS by the "WAP server" securely located at the company providing the service.

In other words, a model like this where the WAP gateway has two modes. A "normal mode" where it works like WAP gateways work today, and a "passthrough" mode where the gateway detects the WTLS stream and simply lets it pass through.

"Passthrough mode"

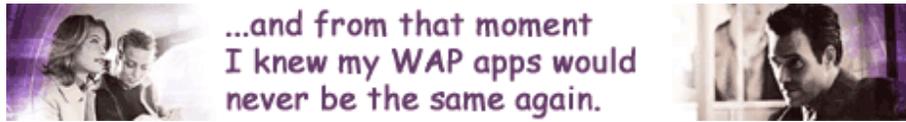


Some good information on securing WAP are available at the following locations:

- Wapforum's WTLS specs (high caffeine factor): [SPEC-WTLS-19991105](http://www.wapforum.org/specs/wtls-19991105)
- Baltimore Telepathy's Secure Demonstration: <http://www.baltimore.com/telepathy/wdemo.asp>
- Tantau's excellent paper covering, among other things, WAP protocol structures (**register** first!): [An Introduction to WML Programming and Third-Party WAP Toolkits](http://www.tantau.com/wml/wmlprog.html)
- Openwave.com's excellent paper on wireless security (**register** first): [Understanding Security on the Wireless Internet](http://www.openwave.com/wireless_security.html)

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10 - WMLscript in detail

Expand your applications even further with scripts that run on WAP devices.

[10.1 Where can I learn about WMLScript?](#)

[10.2 Which functions are available in the WMLscript Lang library?](#)

[10.3 Which functions are available in the WMLscript Float library?](#)

[10.4 Which functions are available in the WMLscript String library?](#)

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10.2 Which functions are available in the WMLscript Lang library?

The following functions are available in the **Lang** library. Note that this is meant as a basic introduction and a quick reference. The authoritative source on WMLscript is [WAPforum](#) and the latest approved WMLscript reference is available [here](#).

The functions in this section are accessed by **Lang.functionName**

abs(*number*) returns the absolute value of *number*

min(*number1*,*number2*) returns smallest of *number1* and *number2*, or *number1* if equal

min(*number1*,*number2*) returns largest of *number1* and *number2*, or *number1* if equal

parseInt(*string*) returns the integer value of *string*

parseFloat(*string*) returns the floating point value of *string*

isInt(*string*) returns *true* if *string* can be converted to an integer

isFloat(*string*) returns *true* if *string* can be converted to a floating point value

maxInt() returns the maximum supported integer value

minInt() returns the minimum supported integer value

float() returns *true* if floating point values are supported

exit(*any*) exits WMLscript and returns *any* to the caller

abort(*errorDescription*) aborts WMLscript and returns *errorDescription* to the caller

random(*integer*) returns a random integer between 0 and *integer*

seed(*integer*) seeds the random number generator with the value of *integer*

charSet() returns an integer representing the [MIBenum](#) of the character set supported by the WMLscript interpreter.

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10.3 Which functions are available in the WMLscript Float library?



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10.3 Which functions are available in the WMLscript Float library?

The following functions are available in the **Float** library. Note that this is meant as a basic introduction and a quick reference. The authoritative source on WMLscript is [WAPforum](#) and the latest approved WMLscript reference is available [here](#).

The functions in this section are accessed by **Float.functionName**

int(*number*) returns the integer part of *number*

floor(*number1*) returns the integer value closest but not greater than *number*

ceil(*number1*) returns the integer value closest but not less than *number*

pow(*number1*,*number2*) returns the value of *number1* raised to the power of *number2*

round(*number*) returns the value of *number* rounded to the closest integer value

sqrt(*float*) returns the square root of *float*

maxFloat() returns maximum supported floating point value

minFloat() returns minimum supported floating point value

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10.4 Which functions are available in the WMLscript String library?

The following functions are available in the **String** library. Note that this is meant as a basic introduction and a quick reference. The authoritative source on WMLscript is [WAPforum](#) and the latest approved WMLscript reference is available [here](#).

The functions in this section are accessed by **String.functionName**

String indexes start at 0, i.e. the first character in a string is at position 0.

length(*string*) returns length of *string*

isEmpty(*string*) returns *true* if *string* is empty

charAt(*string,index*) returns a string containing the character as position *index* in *string*

substring(*string,start,length*) returns a string containing all characters in *string* from position *start* and *count* characters forward

find(*string,substring*) returns the position where *substring* is found in *string*. If no match, -1 is returned

replace(*string,oldsubstring,newsubstring*) replaces all occurrences of *oldsubstring* in *string* with *newsubstring*

elements(*string,character*) returns the number of elements present in *string* separated by *character*

elementAt(*string,index,character*) returns the *index*'th element in *string* separated by *character*

removeAt(*string,index,character*) returns *string* after the *index*'th element has been removed separated by *character*

replaceAt(*string,element,index,character*) returns *string* after the *index*'th element has been replaced by *element* separated by *character*

insertAt(*string,element,index,character*) returns *string* after the *element* has been inserted in the *index*'th element separated by *character*

squeeze(*string*) returns *string* after all whitespaces inside *string* has been removed

trim(*string*) returns *string* after all leading and trailing whitespaces has been removed

compare(*string1,string2*) compares *string1* with *string2* and returns -1 if less, 0 if equal or 1 if greater

toString(*number*) returns *number* converted to a string.

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The Wireless FAQ

11.2 Where can I download OUI from?

http://upmkt.openwave.com/dev_support/oui.cfm

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11.3 Which development platforms does OUI support?

OUI beta 1.0 supports Java 2. PHP, COM and .Net are on their way.

You may want to check the <http://developer.openwave.com> site for the latest update on this.

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11.4 Where can I find more information (mailing lists, support) about OUI?

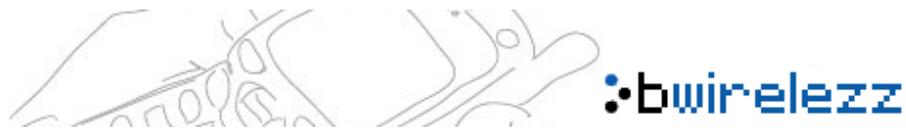
For a quick tutorial: [oui-support](#) you can also download a [Diagram](#)

OUI ships with extensive documentation, so you may want to download the package (2.5 megs) to look at the docs.

In addition to standard openwave [support](#), there is an [independent mailing list](#) on Yahoogroups (ex, Egroups.com). A few Openwave engineers are monitoring the traffic.

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11.5 How do I get started with OUI in the shortest possible time?

It depends. If you are familiar with Java and JSP, you just need to download the [OUI package](http://developer.openwave.com) (<http://developer.openwave.com>) and install the oui.jar file and the oui.tld and xhtmloui.tld files in the appropriate directories for your app-server.

If you are not familiar with JSP, you will need a Java application server. The installation guide in the OUI package will guide you through the installation of Java 1.3.1 and Tomcat 3.2.3 on your windows NT/2000 PC. Afterwards, you can install the OUI lib files in your Tomcat app server and start working with OUI.

Don't forget to look at the GettingStarted guide (included in the package) for great examples on how to use the library.

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Authoring for Multiple WAP devices
Absolutly NOT.... OUI

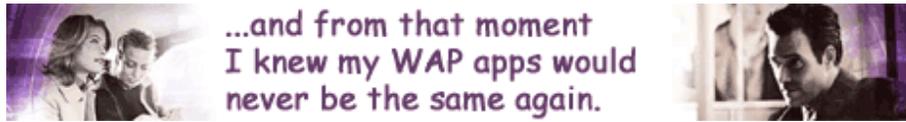
The Wireless FAQ

11.6 Which application servers are supported?

OUI has been extensively tested on Tomcat 3.2.1 and smoke tested on a large number of other java applications servers (among others, JRun, Tomcat 4.x, BEA, Reisin). In general, OUI should run on any Java application server conforming to the Servlet 2.2 and JSP 1.1 standards. If you find that OUI does not work on some application servers which satisfies the above requirements, please shout: you can use openwave support, or the OUI independent mailing list where some Openwave engineers usually hang around.

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11.7 Should I program using the Java API, the WML taglib or the XHTML taglib?

It depends.

- Use Java if you want maximum flexibility and Java programmers are cheap in your shop or if you plan to use OUI outside of the context of Java servlets.
- Use the WML tag-lib if you want to have maximum ease of development and maximum control on today's devices.
- use the XHTML-MP tag-lib if you want to start playing around with XHTML before XHTML devices become a reality in your market.

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11.8 What's the difference between core-level optimization and application-level optimization?

OUI recognizes classes of devices and introduces usability optimizations for them automatically. This is referred to as "core-level optimization". If you want to optimize for a specific device that is not automatically recognized by OUI, you can do this at the application level (ex: provide a different picture for Ericsson R380 phones). This is called 'application-level optimization'

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11.9 Can I run OUI on Windows 98?

Yes!

While the installation guide only covers Win NT/Win2K, once you manage to install Java and Tomcat on your Win98 PC, you are ready to go. Please refer to Tomcat installation to install on win98 PCs. You may find this [tip](#) to enlarge the DOS environment space useful in some cases. ([Environment space in DOS Windows, what it is, how to increase it](#))

[[Main](#)] [[11 - Openwave Usability Interface \(OUI\)](#)]

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Authoring for Multiple WAP devices
Absolutly NOT.... **OUI**

The Wireless FAQ

12 - iMode section

Start testing and developing iMode applications before the hardware hits the streets of Europe and the US.

[12.1 Why is there an iMode section in this wireless FAQ?](#)

[12.2 What is I-Mode, and where can I find out more about it?](#)

[12.3 Where can I find an iMode emulator?](#)

[12.4 How is iMode different from WAP?](#)

[12.5 How does Compact HTML \(CHTML\) work?](#)

[12.6 How can I tell iMode browsers from other browsers?](#)

[12.7 How does iMode work?](#)

[[Main](#)]

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The Wireless FAQ

12.1 Why is there an iMode section in this WAP FAQ?

It's true that iMode has very little to do with WAP on the technical side, but many of you developers will come almost certainly in contact with I-Mode, and there's really not that much information available on the subject. At least not yet. iMode is getting established in Asia, and will most likely catch on in Europe as well. Further, there is talk about future WAP versions incorporating iMode compatibility. Better be prepared.

And even if you should never come in contact with iMode, it doesn't hurt to put some more nice technical information into that thing between your ears :-)

[[Main](#)] [[12 - iMode section](#)]

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Fast, Good and Free ...~~Pick Two ;)~~
Pick Three!!! OUI

The Wireless FAQ

12.3 Where can I find an iMode emulator?

www.access.co.jp/top.asp

www.c-media.com/mail/formmail.asp

www.monde.to/imode/

uni-labo.com/products/iEmulator/eindex.asp

www.openwave.com

www.waprofit.com/products/emudownload.asp

[[Main](#)] [[12 - iMode section](#)]

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The Wireless FAQ

12.4 How is iMode different from WAP?

The difference between iMode and WAP is first of all that iMode uses another markup language. For WAP, the markup language is WML (Wireless Markup Language) while iMode uses CHTML (Compact HTML). Not to be confused with "[Chunks of HTML](#)", a phrase related to generating dynamic HTML content.

Compact HTML has an advantage over WML in that a large majority of WML developers come from the "web" world where they are used to HTML. Compact HTML is a subset of HTML 2.0, 3.2 and 4.0. However, the future of internet content serving is XML, and from XML the step to WML is hardly noticeable. It's much more noticeable with Compact HTML or HTML.

iMode with its markup language similar to HTML is **NOT** the WAP killer the media has been waiting for. To be honest both technologies are in their infancy, and would do well to learn from each other.

You can read a lot more about Compact HTML [here](#).

iMode browsers support images in the GIF format. This is likely to change as the rest of the "web" world is turning away from the format due to patent problems.

Compact HTML does **not** support the following

- JPEG images
- Tables
- Image maps
- Multiple character fonts and styles
- Background image
- Frames
- Style sheets
- <INPUT> buffers larger than 512 bytes
- <SELECT> buffers larger than 4096 bytes

iMode also has a very different set of protocols, but reliable information on this is not yet available. I'd rather not base this on rumours. Stay tuned.

[[Main](#)] [[12 - iMode section](#)]

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The Wireless FAQ

12.5 How does Compact HTML (CHTML) work?

Compact HTML, or CHTML is the markup language of iMode and is a subset of HTML 2.0, 3.2 and 4.0. This is not meant as a reference guide to Compact HTML, but simply shows which tags are available and how to use them.

Strangely enough, the MIME content type for Compact HTML is the same as for HTML, **text/html**

All current iMode browser version will read all HTML 1.0 tags. The 520i series iMode browsers will in addition read HTML 2.0 specific tags. In addition, the browser supports the following tags. Since some tags are supported on some iMode browsers, and others not, you should attempt to detect which browser version that is being used. The procedure is explained [here](#).

For the **current** authoritative source on what Compact HTML contains, read the [Compact HTML for Small Information Appliances](#) available at [W3C](#).

In addition to most HTML 1.0/2.0 tags, note the following differences:

Tag name	Action
<MARQUEE>	<i>Horizontal scrolling of text string</i>
<BLINK>	<i>Blinking of text string</i>
	<i>Sets font <u>color</u></i>
<BODY>	<i>Defines the background, text and link colors</i>
<SELECT>	<i>Unknown</i>

The following additional attributes are supported

Attribute name	Action
istyle	<i>Defines the <INPUT> text style</i>

[[Main](#)] [[12 - iMode section](#)]

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The Wireless FAQ

12.6 How can I tell iMode browsers from other browsers?

Just like with WML browsers, you will need to know which browser is being used to display your Compact HTML content to keep compatibility as high as possible. The procedure for WAP devices is explained [here](#).

This detection of browsers has to be done on the server side, and the following very simple PHP code will simply show you some details about the browser. From this you will be able to tell if the iMode browser can display HTML 1.0 or HTML 2.0 with iMode extensions, and so on.

```
<?
    $browserinfo = split("/", $HTTP_USER_AGENT, 5);           // Split the
USER_AGENT string into 5 parts
    echo("This is a ".$browserinfo[0]. " browser\n");        // Usually says
"DoCoMo"
    echo("It supports HTML ".$browserinfo[1]. "\n");         // Contains the
supported HTTP version number
    echo("The browser model is ".$browserinfo[2]. "\n");     // Contains the
browser model
    echo("The cache size is currently ".$browserinfo[3]. "\n"); // Contains the
current cache size in Kilobytes
    echo("Remaining information: ".$browserinfo[4]. "\n");   // Displays the rest
of the USER AGENT string, if any.
?>
```

In short, the script above takes the HTTP_USER_AGENT string which for an iMode browser looks something like **DoCoMo/1.0/F50i** for the 501 models, and **DoCoMo/2.0/F502i/c10** for the 502 models. The first part of the string says **DoCoMo** indicating that it is an iMode client. The next part indicates the supported HTML version number. The third part indicates the device model number, such as "F501i" and "F502i".

The fourth part, only available on certain 502 models indicates the current cache size. Like with WAP devices, an iMode device can only accept a certain amount of data in one go. The number is in kilobytes, and the default size is 5KB.

[[Main](#)] [[12 - iMode section](#)]

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Authoring for Multiple WAP devices
Absolutly NOT.... OUI

The Wireless FAQ

12.7 How does iMode work?

Like WAP, iMode is a way of providing information to mobile devices. iMode is however slightly different from WAP in that it uses [cHTML](#) as a markup language, and uses more traditional internet protocols to deliver it. Or rather, less of the new wireless protocols. The content is served using HTTP to a so called iMode center which in a way works like the WAP gateway. One major difference is that this iMode center is under the control of the developers of iMode, NTT DoCoMo. In WAP, gateways are and can be owned by virtually anyone with an internet connection. The iMode center performs protocol conversions which enable the content to be delivered to the phone.

Although there's nothing preventing iMode's "single" gateway structure from handling a large number of users, it creates a sort of monopoly that the US and European markets will most likely not agree to. It is also very likely that this structure will be changed as iMode, like WAP, evolves.

Thanks to [Peter Roxburgh](mailto:peter.roxburgh@securetrading.com) (peter.roxburgh@securetrading.com) for the insight.

[[Main](#)] [[12 - iMode section](#)]

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The Wireless FAQ

13 - WAP Gateways and WAP Servers

How the most important part of the WAP "chain" works, which WAP gateway does what, and who makes them.

[13.1 What is a WAP gateway?](#)

[13.2 What is a WAP Server?](#)

[13.3 Who is responsible for setting up the connection to the WAP gateway?](#)

[13.4 Which WAP gateways and WAP servers are available on the market?](#)

[13.5 How "compatible" are each of the WAP gateways?](#)

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The Wireless FAQ

13.1 What is a WAP gateway?

A WAP gateway is a piece of software that has several functions in the "chain" between the WAP device and the web server. These functions are in general:

- Converting the markup language (WML) from textual format to tokenized (binary/compressed) format which is readable by the WAP device.
- Translating the requests from the WAP device to HTTP requests for the "web" world.
- Convert between the SSL encryption used in the "web" world and the WTLS encryption used in the WAP world.
- Convert between the "transport" protocol of the "web", TCP, and that of the WAP world, WDP.

Optionally many gateways also perform other conversions such as between plain text files, simple HTML files etc into a WAP readable format. If a WAP gateway is hosted by a mobile operator, the mobile operator may use the gateway to add mobile specific information into the HTTP stream such as the subscriber number, location details etc (although this is not widely used).

Some WAP gateways are [publicly available](#) on the internet, while others are hosted by mobile operators, and these are usually restricted to accept WAP devices coming from the mobile operator's dial in service only.

A small number of gateways, or gateway-like devices ("[WAP Servers](#)") are hosted by the content providers, i.e. the people who own the web servers with the WAP content.

Related information

[Tantau's website](#)

Chapter 1 in "[Professional WAP](#)" from Wrox

Chapter 3 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[13 - WMLscript in detail](#)]

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The Wireless FAQ

13.3 Who is responsible for setting up the connection to the WAP gateway?

As a normal user you will most likely have bought a WAP device (typically mobile phones) that either comes pre-configured from the place you bought it, configured automatically from the mobile network operator, or you will have received instructions from the mobile operator on how to configure it manually. Almost all mobile operators that offer WAP connectivity have their own WAP gateway.

The WAP device is responsible for setting up the connection to the WAP gateway, and the configured IP address of the WAP gateway will be held on the WAP device. When it comes to mobile phones, most of them can be reconfigured to use any other gateway, and very few cannot.

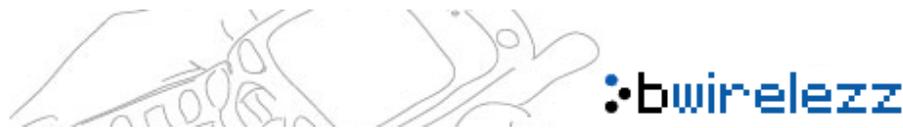
As a WAP site owner (WAP content provider) and WAP developer you do initially not need to worry about who hosts the gateway. Once you get more advanced, you will however need to remember that different gateways work in different ways and have different types of functionality. And more important, you need to remember that in almost all cases, you do not know which type of gateway, and you have little or no control over which type of gateway that a user will use to access your site.

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

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The Wireless FAQ

13.4 Which WAP gateways and WAP servers are available on the market?

Please note that the products in this list are both [WAP gateways](#) and so called [WAP servers](#). All WAP servers can in theory at least be used as pure WAP gateways. You are reminded that normal WAP users do not need to worry about WAP gateways and WAP servers as WAP gateways that give you internet connectivity are usually provided by your mobile operator, and a WAP server is a WAP gateway and content server (web servers) combined. WAP applications developers might want to consider testing their applications on different WAP gateways and WAP servers. WAP gateways are really for mobile operators and WAP servers are for companies that have special needs such as intranet based WAP services, or specialized internet based services - and many do.

Kannel: Open Source WAP and SMS gateway

The [Kannel WAP and SMS gateway](#) is probably the best known open source product in this category. As this is an [Open Source](#) product with a large number of clever people contributing to the development, the specs are likely to change often. Also note that this is a pure WAP gateway rather than a WAP gateway and a content server combined into a WAP server.

The Kannel WAP and SMS gateway is definitely worth taking a look at. Visit their [site](#) now.

Tantau Wireless Internet Platform

The [Tantau Wireless Internet Platform](#) is a family of wireless internet software products which gives a high level of connectivity. It's also worth mentioning that this product runs on a large number of platforms.

Key features, ([Full data sheet](#))

- WAP 1.1 compliant
- Complete WAP stack and content encoders for WML and WML Script
- User authentication and access control
- WTLS and SSL/TLS security
- Enterprise Application CORBA 2.2 ID, CORBA IIOP (1.0 and 1.1) Integration CORBA CosNaming Nameserver
- Open Database Access OLE/DB, ODBC
- Platform gateways Tandem: Pathway, NS-SQL, Enscribe IBM: MQ, CICS
- LDAP connectivity
- Java Servlets, Java Applications, Corba IIOP
- SNMP support
- Application and content hosting
- Available for SuSE Linux 6.3, RedHat Linux 6.1, Sun Solaris 7, HP Unix 11.0, Compaq Tru64 Unix v4.0F, Compaq NSK D47+, Windows NT4.0

Materna Carrier WAP gateway

The [Materna Carrier WAP gateway](#) is a WAP server for both internet and intranet based services, and is the larger of Materna's two products. Because of its content and application hosting capabilities, this product is classed as a WAP server. Note that due to the way the Materna site was set up, it was not possible to link directly to the section on the Materna Carrier Gateway. You'll have to navigate on your own.

Key features, ([Full data sheet](#))

- WAP 1.1 compliant
- Complete WAP stack and content encoders for WML and WML Script
- User authentication and access control
- WAP user identification via MSISDN id
- Subscriber identification via RADIUS support
- Distributable and scalable architecture
- Graphical web-based user interface
- Configuration management for operating and maintaining the WAP gateway
- Statistic module for control of gateway activities
- Transaction logging of subscriber activities

13.4 Which WAP gateways and WAP servers are available on the market?

- Generation of CDRs for billing purposes
- Support of multiple SMS Centers
- Over-The-Air (OTA) configuration
- WTLS and SSL/TLS security
- SNMP support
- Application and content hosting
- Available for Sun Solaris, HP Unix

Materna Corporate WAP gateway

The [Materna Corporate WAP gateway](#) is the smaller of the two Materna products and is intended for intranet based services. Because of its content and application hosting and connector capabilities, this is classed as a WAP server. Note that due to the way the Materna site was set up, it was not possible to link directly to the section on the Materna Carrier Gateway. You'll have to navigate on your own.

Key features, ([Full data sheet](#))

- WAP 1.1 compliant
- Complete WAP stack and content encoders for WML and WML Script
- User authentication and access control
- WAP user identification via MSISDN id
- Graphical web-based user interface
- Configuration management for operating and maintaining the WAP gateway
- Statistic module for control of gateway activities
- Transaction logging of subscriber activities
- Support of multiple SMS Centers
- Over-The-Air (OTA) configuration
- WTLS and SSL/TLS security
- Connectivity towards Microsoft Exchange and Lotus Notes
- Application and content hosting
- Available for Sun Solaris, HP Unix, and MS Windows NT

Nokia WAP Server 1.1

[The Nokia WAP Server 1.1](#) is one of the more widely used WAP servers, but it is by many WAP developers considered slow and ill optimized in its WML compilation. The cost of this product is also fairly high. One very positive thing is that a 30 day [trial version](#) is available for download.

Key features, ([Full data sheet](#))

- WAP 1.1 compliant
- WML 1.1 and 1.2 encoders/decoders (compilers)
- User authentication and access control
- WAP user identification via MSISDN id
- Complete WAP stack and content encoders for WML and WML Script
- Open API for back-end system integration
- Over-The-Air (OTA) configuration
- WAP email connector (POP, IMAP, SMTP and MAPI)
- LDAP connectivity
- SMS Center (can use 6100 and 5100 series phones as bearer for SMS - Windows NT only)
- WTLS and SSL/TLS security
- Application and content hosting
- Requires Java Runtime Environment 1.2.2 and Java HotSpot Performance Engine 1.0.1
- Runs on Windows NT, Sun Solaris and HP-UX

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[13 - WMLscript in detail](#)]

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Authoring for Multiple WAP devices Absolutly NOT.... OUI

The Wireless FAQ

13.5 How "compatible" are each of the WAP gateways?

Since all data requested from a content server must pass through the WAP gateway, it is very important that the contents reaches the browser in a proper state. WAP gateways convert or compile the textual WML code into a binary format, and this conversion process is different in virtually every gateway. Some do it faster than others, some do it better than others. One piece of code does not necessarily produce the same binary content. It's not uncommon to find that one deck works fine via one gateway, while crashing via another.

The intention is to give you as an application developer an overview of what to expect from each gateway, and maybe even to help gateway developers get their products on the right track.

With the help of the brilliant people of the [WML and WMLscript Programmers](#) mailing list, a detailed list of gateway inconsistencies will be compiled.

For now, the following aspects of the WAP gateway will be examined: *(The list is guaranteed to change frequently)*

- Does the gateway identify itself to the web server?
- Does the gateway support some form of unique ID for the device it's provisioning?
- Does the gateway support cookies according to the HTTP specifications?
- Does the gateway support some form of cookie?
- Does the gateway pass through any unrecognized element/attribute to the browser as unencoded text?
- Does the gateway scramble HTTP headers?
- Does the gateway convert content and images in some way?
- Does the gateway handle and convert charsets to and from what the device requested?
- What is the best, average and worst average compilation ratio?
- Is the gateway normally deployed by network operators?
- How does the gateway handle already compiled WMLC?
- How does the gateway handle WMLscript compilations?
- How does the gateway handle caching?
- How does the gateway support additional data types such as GIF, BMP, HTML etc etc?
- How does the gateway handle different character sets?
- How well does the gateway comply with interoperability specifications?
- Is the gateway mostly used in vertical or horizontal applications?
- Which platforms does the gateway run on?
- Does the gateway support subscriber number forwarding?
- Does the gateway support WTLS and SSL?
- Is the gateway also capable of serving content?
- How much does the gateway cost?

If you feel you have information to add to the list, please feel free to contact the [FAQ maintainer](#).

Related information

Chapter 1 in "[Professional WAP](#)" from Wrox

[[Main](#)] [[13 - WMLscript in detail](#)]

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The Wireless FAQ

14 - Short Message Service (SMS)

Probably one of the most under rated, but still well used extras of GSM.

[14.1 What is SMS?](#)

[14.2 What can SMS be used for?](#)

[14.3 What is EMS?](#)

[14.4 What is MMS?](#)

[[Main](#)]

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The Wireless FAQ

14.1 What is SMS?

SMS or Short Message Service is part of the [GSM](#) digital cellular standard.

SMS is a "store and forward" message system which means that the message is sent from the originator to a so called SMS center, and then on to the recipient. Once the message is received in the other end, an optional confirmation message is sent back to the originator which in effect guarantees delivery. Because SMS messages are sent in the channel control, messages can be sent and delivered even if the phone's voice/data channel is occupied. SMS messages can be up to 160 characters in length, and although not all devices support it, it is possible to link 160 character messages together to form a longer message.

Related information

[Mobilesms.com](#)'s intro to SMS

[An Introduction to the Short Message Service](#) at MobileIPWorld.com

[An overview of SMS](#) at [GSM World](#)

www.cellular.co.za

[[Main](#)] [[14 - Short Message Service \(SMS\)](#)]

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The Wireless FAQ

14.2 What can SMS be used for?

You might think that it's a complete waste of time typing in messages of max 160 characters when you might as well call the person and just tell him what you want. You might even think that it's impossible to type in a message within a reasonable amount of time. The people sending close to 10 billion SMS messages per month (world wide) don't seem to mind. (Remembering that the price per message is around USD 0.15 in most countries)

Besides sending messages, SMS can be used as a means to transport data to a handset. This includes ringing tones and operator logos which is big business at least in some countries in Europe. But then we Europeans always were a bit strange.

In addition, and what has become even more popular with the introduction of WAP, there's the possibility to send phone configuration data over SMS. This means that a WAP browser can in effect be remote configured from a service provider or mobile operator. However, as this involves having to stick to a standard, not all handset manufacturers support this feature.

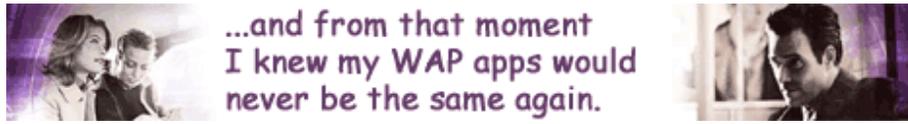
SMS can also be used while we wait for WAP's PUSHing feature. An SMS message can originate from a content server which the recipient can use to link directly to a URL. Unfortunately, very few WAP enabled phones support this "clickable URL" functionality in SMS messages.

Related information

[SMS Tools \(provided by www.devx.com\)](http://www.devx.com)
www.cellular.co.za

[[Main](#)] [[14 - Short Message Service \(SMS\)](#)]

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The Wireless FAQ

14.3 What is EMS?

EMS can be referred to as enhanced SMS, and adds life to the users' SMS text messages. Messages sent with the 3GPP standard EMS (Enhanced Message Service) contain a combination of text and simple pixel-image and/or melody. Users may download images and melodies from the Internet, or for even greater self-expression, create them on their own directly in the phone. Unlike SMS messages, the text of an EMS message can be formatted using a variety of fonts, sizes, type styles, etc. Ericsson's EMS is a backwards-compatible service, meaning that the text portion of its messages can be received by terminals not supporting EMS. EMS is an open 3GPP standard, and paves the way for the introduction of MMS.

EMS specifications are found in "Technical Specification 3GPP; Technical realization of the Short Message Service (SMS)" (3G TS 23.040), which can be downloaded from 3rd Generation Partnership Project website at http://www.3gpp.org/ftp/Specs/archive/23_series/23.040/

Related information

[EMS White Paper by Ericsson\(pdf\)](#)

[3rd Generation Partnership Project website](#)

[EMS Developers' Guidelines\(pdf\)](#)

[[Main](#)] [[14 - Short Message Service \(SMS\)](#)]

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The Wireless FAQ

14.4 What is MMS?

MMS is the Multimedia Messaging System. It is the evolution of SMS, the Short Messaging System, a system for sending and receiving short text-based messages. MMS is the next generation upgrade for SMS in 3G networks. However, MMS does not require a 3G network. MMS can function under a 2G or 2.5G network, and handsets and networks that support MMS are expected by the end of 2001.

The Multimedia Messaging Service (MMS), as its name implies, is intended to provide a rich set of content to subscribers in a messaging context. It supports both sending and receiving of such messages by properly enabled client devices.

The Multimedia messaging service is viewed as a non-real-time delivery system. This is comparable to many messaging systems in use today. Prime examples include traditional email available on the Internet and wireless messaging systems such as paging or SMS. These services provide a store-and-forward usage paradigm and it is expected that the MMS will be able to interoperate with such systems. Real-time messaging also exists in various forms. For example, instant messaging available from various vendors or various chat services (e.g. text, voice) are becoming popular. Such services are not currently supported with the MMS system but may be considered for future releases.

Multimedia Messaging Service (MMS) is a system application by which a WAP client is able to provide a messaging operation with a variety of media types. The service is described in terms of actions taken by the WAP MMS Client and its service partner, the MMS Proxy-Relay, a device which operates as a WAP Origin Server for this specialized service. Additional service aspects are supported by the MMS Server as well as other messaging servers, such as an email server and wireless messaging systems (e.g. SMSC). This specification defines application-level protocol activities that take place to realize the MMS service within the WAP environment.

The first MMS messages should be thought of as "Slide shows" [SMIL](#) (Synchronized Multimedia Integration Language), is the layout language that is used for creation of multimedia presentations consisting of multiple elements in a common, synchronized timeline. Visually, SMIL is strikingly similar to HTML in its syntax and constructs.

```
<smil>
<head>
  <layout>
    <root-layout height="225" width="150" background-color="#ffffff" title="Sync"/>
    <region id="timing" width="150" height="75" top="0" left="0" z-index="1" />
    <region id="is" width="150" height="75" top="75" left="0" z-index="1" />
    <region id="everything" width="150" height="75" top="150" left="0" z-index="1" />
  </layout>
</head>

<body>
<seq>
  
  
  
<par>
  
  
  
</par>
</seq>
</body>
</smil>
```

Related information

14.4 What is MMS?

[Nokia Whitepaper on MMS](#) (pdf)

[Ericsson Whitepaper on MMS](#) (pdf)

[Ericsson MMS developer Guide](#) (pdf)

[Nokia MMS developer Guide](#) (pdf)

[MMS Conformance](#) (pdf)

[MMS Client Transaction Documentation](#) (pdf)

<http://www.ericsson.com/mobilityworld> (you need to register first)

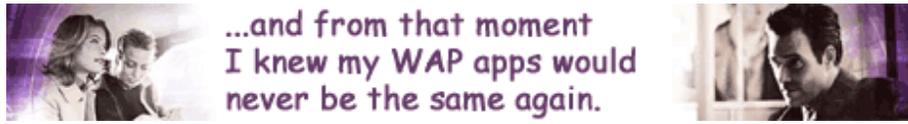
<http://www.forum.nokia.com> (you need to register first)

<http://www.3gpp.org>

<http://www.wapforum.org>

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The Wireless FAQ

A - About this FAQ

Information on who maintains the FAQ, how content is added, and a big list of thanks to those who have helped the FAQ become what it is.

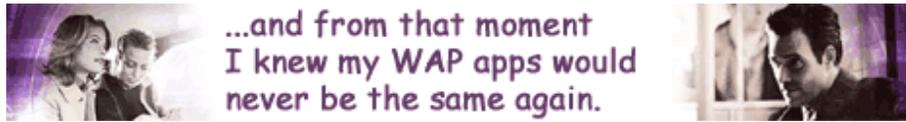
[A.1 Who wrote this FAQ?](#)

[A.2 How can I contribute to this FAQ?](#)

[A.3 Where can I test the examples applications in the FAQ?](#)

[[Main](#)]

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The Wireless FAQ

A.1 Who wrote this FAQ?

The FAQ was an initiative of Espen Lyngaas and Luca Passani, with contributions from several members of the list. First maintainer was Espen Lyngaas. Current maintainer is Ed Alkema

At present the FAQ contributors are:

- [Espen Lyngaas](mailto:espen.lyngaas@colorline.no) (espen.lyngaas@colorline.no)
- [Luca Passani](mailto:luca.passani@openwave.com) (luca.passani@openwave.com) (Thanks for the 2 minute complete XML lesson, Luca! :)
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- [Martin Loman](mailto:martin.loman@brainpool.se) (martin.loman@brainpool.se)
- [Adam Kozubowicz](mailto:adam@mobile.net.pl) (adam@mobile.net.pl) (Thanks for the great links - keep them coming!)
- [Robin van Emden](mailto:rave@dataweb.nl) (rave@dataweb.nl) (Thanks for the ASP redirector!)
- [Kim Christiansen](mailto:thames.ditton@cwcom.net) (thames.ditton@cwcom.net) (Thanks for helping out with the abbreviations)
- [Jorrit Waalboer](mailto:jwaalboer@kronkel.com) (jwaalboer@kronkel.com) (Thanks for all the misc info)
- [Armand Datema](mailto:ArmandD@EXA.NL) (ArmandD@EXA.NL) (Thanks for the links)
- [Paul St George](mailto:email@paulstgeorge.com) (email@paulstgeorge.com) (Thanks for the image preload code)
- [Roberto Hortal](mailto:roberto@hortal.com) (roberto@hortal.com) (Thanks for the .htaccess description)
- [Gaddo F. Benedetti](mailto:gaddo@gaddo.net) (gaddo@gaddo.net) (Thanks for the ASP POST fix code)
- [Alastair France](mailto:afrance@corp.openwave.com) (afrance@corp.openwave.com) (THANKS! for all the excellent UP specific stuff!)
- [Al Sutton](mailto:al@alsutton.com) (al@alsutton.com), [John McAleely](mailto:john@mcaleely.com) (john@mcaleely.com) and [Patrice Slupowski](mailto:pslupowski@waptoo.com) (pslupowski@waptoo.com) (Thanks for the input on the 302 redirect problem!)
- [Werner Forkel](mailto:wapmaster@waplabor.de) (wapmaster@waplabor.de) (Thanks for the subscriber number script!)
- [Peter Roxburgh](mailto:peter.roxburgh@securetrading.com) (peter.roxburgh@securetrading.com) (Thanks for the iMode insight!)
- [Ed Alkema](mailto:ealkema@bwirelezz.com) (ealkema@bwirelezz.com)

Bring content to the FAQ, and your name will appear on the list :-)

Should I forget to mention your name, please let me know!

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The Wireless FAQ

A.2 How can I contribute to this FAQ?

If you at some point feel that you have information regarding the wireless environment, please let us know. It's really up to you how much effort you want to put into it. As a minimum you could just mail me whatever information you have. It does of course help if you add some links where appropriate and format any code examples in a nice way.

If you are uncertain that the info you have is correct or at all interesting, send it to me anyway.

Please send the information directly to the [FAQ Maintainer](#). If you get the information through the company you work for, please make sure that you're not breaking any rules giving away the information. Also let me know if you do not want your name and e-mail address added to the FAQ.

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The Wireless FAQ

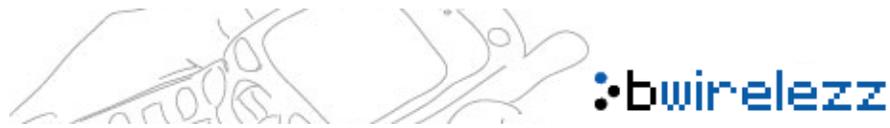
A.3 Where can I test the examples applications in the FAQ?

With the exception of a few, all the examples in this FAQ are available to test at the below URL. The demos section is readable by both WML and HTML browsers.

<http://www.thewirelessfaq.com/demos.asp>

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The Wireless FAQ

The Wireless Wall of Fame

Put faces to the names of some of the famous, and not yet famous people of the wireless world.

Welcome to the Wireless Wall of Fame! On display we have the famous and the not yet quite that famous up and coming stars of the Wireless world.

Mostly this is just a gallery of the people spending all their time helping each other out at [the WMLProgramming mailing list](#) at YahooGroups.com.

If you're a member of the [the WMLProgramming mailing list](#), and you want to have your picture up on the exclusive Wireless Wall of Fame, please mail your picture in any format (within reason) and of any size (within reason) to [the FAQ maintainer](#).



[Espen Lyngaas](#)



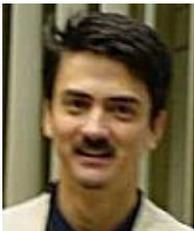
[Luca Passani](#)
[Openwave.com](#)



[Armand Datema](#)
[waplinks.com](#) owner



[Hans-Henrik T. Ohlsen](#)
Leader of the Danish WAP Experience Exchange Group



[Rob Cayzer](#)

WAP Consulting Group Asia Pacific,
Arthur Andersen



[Detlef Beyer](#)



[Don Amaro Conception](#)
[TransWAP Project](#)



[Mickael Faivre-Macon](#)
Megaton Technology, Taiwan



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PHP/XML/WML e-Business developer



[Merv Tan](#)

[Australian Telecomms. Coop. Research center](#)



[Richard Weeks](#)

[Grey Interactive Services \(UK\) Ltd](#)



[Siddhartha Arora](#)

Cambridge Technology Partners, Zurich



[Alex Kriegel](#)
[Teklogix Inc.](#)



[Mark Healey](#)
[Kingston Internet Ltd](#)



[Fergal Moran](#)
[WASP Technologies](#)



[Martin Loman](#)
[Brainpool Consulting AB](#)



[Matteo Ambrosio](#)
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[James Pearce](#)
Founder of [WAPtastic.com](#)
UK Director, [AnywhereYouGo.com](#)



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[Charles Arehart](#)
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[Sakchart Ngamluan](#)
WAP Developer, Thailand



[Bambang Sadikin](#)
[Wahana Akses Prima,](#)
Indonesia



[Daniel Siegl](#)
[Brainwave Computing](#)
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Mobile Technologies Director,
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[Anders Borg](#)
[AU-Systems AB](#), Sweden



[Werner Forkel](#)
Lawyer and WAP Developer
[Waplabor.de](#), Germany



[Wesley Cornell](#)
[Pipemedia Online](#), UK



[Chagla S.M.C](#)
[Infotech Enterprises Ltd.](#), India



[Daniel Acton](#)
[iTouch](#), South Africa



[Fredrik Ree](#)
[WAP Factory](#), Norway



Philip J. Mikal
Mikal.org, USA

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The Wireless FAQ

FAQ Sections

01 - General

Definitions of terms and advice on getting started. If you're new to wireless technology, you should start here.

- [1.1 In short, what is WAP?](#)
- [1.2 In short, what is WML?](#)
- [1.3 How long will WAP last?](#)
- [1.4 Why use WML when you can use HTML?](#)
- [1.5 What is a good service for the mobile internet?](#)
- [1.6 In short, what is WMLScript?](#)
- [1.7 What is a WML deck of cards?](#)
- [1.8 How do I start writing WAP applications?](#)
- [1.9 How does a WAP device connect to the internet?](#)
- [1.10 Is there a glossary of wireless technology expressions?](#)
- [1.11 Can you recommend any good WAP service providers?](#)
- [1.12 Is there a list of some great WAP applications?](#)
- [1.13 Can you show me some simple example code?](#)
- [1.14 What is the Openwave Usability Interface \(OUI\) ?](#)
- [1.15 We already have a WEB site, how do we get a WAP site?](#)
- [1.16 We already have a HDML site, how do we get a WAP site?](#)

02 - Wireless development resources on the web

Links to wireless developer sites, articles and libraries.

- [2.1 Where can I find more info on wireless technologies?](#)
- [2.2 What Open Source resources are available for the wireless environment?](#)
- [2.3 Is there an updated list of Agent strings somewhere?](#)

03 - Accessing WML contents

How to access already existing WAP sites. WAP browsers for most operating systems. WAP gateways and WAP operator environments.

- [3.1 How do I access WML pages?](#)
- [3.2 How do I bypass my operator and connect "directly" to the internet?](#)
- [3.3 Can I "surf" WAP sites without using a real WAP device?](#)
- [3.4 I'd like to set up my own WAP operator service, what do I do?](#)
- [3.5 Is there a list of available WAP phones and WAP devices on the market?](#)
- [3.6 Where can I find publicly available WAP gateways on the internet?](#)
- [3.7 Where and how do I register a WAP domain?](#)

04 - Serving WML contents

Re-using the code and technology from the wired web in the wireless environment. PHP, ASP, Perl, Java Servlets, etc.

- [4.1 What do I need to serve WML contents to a WAP device?](#)
- [4.2 What's with the HTTP server MIME types?](#)
- [4.3 How can I use PHP to make WML contents more dynamic?](#)
- [4.4 Can you show me some examples serving WAP via PHP?](#)
- [4.5 How do I prevent a WML deck from being read from the cache?](#)
- [4.6 How can I tell HTML browsers from WML browsers?](#)
- [4.7 How do I read data from the WAP device \(telephone number etc\)?](#)
- [4.8 Why is the HTTP User Agent string different with the Openwave.com gateway?](#)
- [4.9 Is it possible to localize text in the browser?](#)

- [4.10 How do I prevent variables from being stored in the cache?](#)
- [4.11 How do I access a database from WML?](#)
- [4.12 How can I control caching when nothing else works?](#)
- [4.13 How can I use ASP to make WML contents more dynamic?](#)
- [4.14 How do I pass a variable from WML to ASP?](#)
- [4.15 Is there a list of other useful stuff for serving WML contents?](#)
- [4.16 How do I use XSL with WML and WAP?](#)
- [4.17 How can I use Perl to make WML contents more dynamic?](#)
- [4.18 What is PUSHing and how does it work?](#)

05 - WML specifics

Details on the Wireless Markup Language used in WAP device browsers. What works where.

- [5.1 What is the general syntax of WML?](#)
- [5.2 Do all WAP devices \(browsers\) comply with WML specifications?](#)
- [5.3 Which phone uses which UP.browser version?](#)
- [5.4 Can I use HTML based developer tools to develop WAP applications?](#)
- [5.5 Where can I find a WML validator?](#)

06 - WAP development specifics

Topics surrounding the development tools used for developing WAP applications.

- [6.1 Where can I download the Nokia SDK?](#)
- [6.2 Where can I download the Ericsson SDK?](#)
- [6.3 Why can I not access pages on the internet from my emulator?](#)
- [6.4 Why doesn't Basic Authentication work with the Nokia SDK?](#)
- [6.5 What is the difference between WAP 1.1 and WAP 1.2?](#)
- [6.6 Where can I download the Openwave SDK?](#)
- [6.7 Where can I download Microsoft's Mobile Explorer?](#)
- [6.8 What's special about the Microsoft Mobile Explorer?](#)

07 - Making it look fancy

Tips and tricks on how to stun your users by making your applications work like a race-horse and not look like a donkey.

- [7.1 Can WAP devices use graphical images instead of just text?](#)
- [7.2 What size screens will I be developing for?](#)
- [7.3 How do I use animated images?](#)
- [7.4 My WBMP images look bad, what can I do?](#)
- [7.5 Can I generate dynamic WBMP images on-the-fly?](#)
- [7.6 How can I send e-mail from a WAP device?](#)
- [7.7 Is it possible to "link" to a telephone number?](#)
- [7.8 How can I prevent a form from having empty fields?](#)
- [7.9 How do I use option fields when the display cannot fit all of them?](#)
- [7.10 Is it possible to "preload" images in WML?](#)
- [7.11 Is it possible to change the font displayed in a browser?](#)
- [7.12 How do I get a WML card to refresh itself?](#)
- [7.13 How do I use streaming media in WAP?](#)
- [7.14 How much data can I send back to the server using GET or POST?](#)
- [7.15 Can color images be used in WAP?](#)
- [7.16 How does Nokia's "Use Number" function work?](#)
- [7.17 What are Openwave.com WML Extensions and how do they work?](#)
- [7.18 Can WML extensions be used in Europe and other GSM areas?](#)
- [7.19 What is WML Extension "Mobile-Originated Prefetch" \(<link> tag\)?](#)
- [7.20 What are WML Extension "nested contexts/activities" \(<spawn> tag\)?](#)
- [7.21 How is the WML Extension localsrc attribute used?](#)
- [7.22 How is the "accesskey" attribute used?](#)
- [7.23 How can I tell which WML version a device supports?](#)

08 - Troubleshooting

When your applications aren't working as they should, chances are that someone has already solved the problem and added the solution to

this FAQ.

[8.1 Why won't my WBMP images appear?](#)

[8.2 The WAP device emulator says text/html mime type is not supported, but my MIME setup is correct?](#)

[8.3 I can't get the <input/> format to work correctly. What's wrong?](#)

[8.4 I think some special characters are breaking my code or links, what can I do?](#)

[8.5 What's the size limit on each WML deck?](#)

[8.6 I can't get POST to work! What's wrong?](#)

[8.7 My ASP code works on emulators but not on real browsers. What's wrong?](#)

[8.8 Why won't my META tags work in WML?](#)

[8.9 Why aren't the server receiving the variables I send it?](#)

[8.10 Why doesn't some Mitsubishi browsers \(Trium\) run WMLScript?](#)

[8.11 Why is the REFERER line in the HTTP header not visible?](#)

[8.12 Why does a normal HTTP 302 redirect not work with WAP?](#)

[8.13 Why won't the Nokia 7110 POST more than 160 characters?](#)

[8.14 Why can't I pass variables with spaces and apostrophes?](#)

[8.15 I can't display a dollar sign in my WML code, what's wrong?](#)

[8.16 My WAP services only works for me, no one else! What is wrong?](#)

09 - Security

Details on one of the most discussed Wireless Application Protocol topics. WTLS, SSL, restricting access and so on.

[9.1 How can I protect certain WML pages/decks from unwanted users?](#)

[9.2 Are Sessions supported in the WAP environment?](#)

[9.3 Are Cookies supported in the WAP environment?](#)

[9.4 How secure is WAP with SSL and WTLS?](#)

10 - WMLscript in detail

Expand your applications even further with scripts that run on WAP devices.

[10.1 Where can I learn about WMLScript?](#)

[10.2 Which functions are available in the WMLscript Lang library?](#)

[10.3 Which functions are available in the WMLscript Float library?](#)

[10.4 Which functions are available in the WMLscript String library?](#)

11 - Openwave Usability Interface (OUI)

Start testing and developing with the Openwave Usability Interface.

[11.2 Where can I download OUI from?](#)

[11.3 Which development platforms does OUI support?](#)

[11.4 Where can I find more information \(mailing lists, support\) about OUI?](#)

[11.5 How do I get started with OUI in the shortest possible time?](#)

[11.6 Which application servers are supported?](#)

[11.7 Should I program using the Java API, the WML taglib or the XHTML taglib?](#)

[11.8 What's the difference between core-level optimization and application-level optimization?](#)

[11.9 Can I run OUI on Windows 98?](#)

12 - iMode section

Start testing and developing iMode applications before the hardware hits the streets of Europe and the US.

[12.1 Why is there an iMode section in this wireless FAQ?](#)

[12.2 What is I-Mode, and where can I find out more about it?](#)

[12.3 Where can I find an iMode emulator?](#)

[12.4 How is iMode different from WAP?](#)

[12.5 How does Compact HTML \(CHTML\) work?](#)

[12.6 How can I tell iMode browsers from other browsers?](#)

[12.7 How does iMode work?](#)

13 - WAP Gateways and WAP Servers

How the most important part of the WAP "chain" works, which WAP gateway does what, and who makes them.

[13.1 What is a WAP gateway?](#)

[13.2 What is a WAP Server?](#)

[13.3 Who is responsible for setting up the connection to the WAP gateway?](#)

[13.4 Which WAP gateways and WAP servers are available on the market?](#)

[13.5 How "compatible" are each of the WAP gateways?](#)

[14 - Short Message Service \(SMS\)](#)

Probably one of the most under rated, but still well used extras of GSM.

[14.1 What is SMS?](#)

[14.2 What can SMS be used for?](#)

[14.3 What is EMS?](#)

[14.4 What is MMS?](#)

[A - About this FAQ](#)

Information on who maintains the FAQ, how content is added, and a big list of thanks to those who have helped the FAQ become what it is.

[A.1 Who wrote this FAQ?](#)

[A.2 How can I contribute to this FAQ?](#)

[A.3 Where can I test the examples applications in the FAQ?](#)

Wireless Developers Mailing Lists

Much of the information in this FAQ comes from a selection of mailing lists dedicated to wireless developers. These lists are well worth checking out.

[The WML and WMLScript Programmers List](#)

Low traffic, moderated list for WML and WMLScript developers. The list is reachable via the web and via email.

[The WMLScript Discussion Forum](#)

Discussion forum which is made up of several moderated lists for wireless developers in general. The lists are reachable via the web and via email.

[The wap-dev Mailing List](#)

Low traffic list for WAP/WML developers. A list archive and subscription tool is available via the web.

[The OUI-support List](#)

Group for technical questions about the Openwave Usability Interface (OUI) development library.

[The wap-dev Mailing List](#)

Low traffic list for WAP/WML developers. A list archive and subscription tool is available via the web.

Note! Remember to check this FAQ before asking a question on these mailing lists

The Wireless Wall of Fame

Put faces to the names of some of the famous, and not yet famous people of the wireless world in [the Wireless Wall of Fame](#).

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