AdSa Life Development
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# Free wireless internet through SMS

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**Abstract**

This experiment is an attempt to establish a wireless internet connection on a cellphone, netbook or laptop without the use of a 3G connection or Wi-Fi. The goal is to establish a free internet connection based on the short message service(SMS) included in the GSM standard. The concept is to use two phones, one host connected to the internet and another phone as client to request and receive web pages through the short message service. For the wireless connection to remain free the two phones require Sim-cards offered by a GSM service that offer free of charge SMS traffic. The experiment was successful and a free internet connection was established however the speed of the internet service was too slow to be used in a practical application.

# Content

# 1   The Concept

*SMS(short message service) is a mobile service originally part of the GSM(Global System for Mobile communications) mobile standard since* 1985 *to allow the transfer of 160 characters from one GSM phone to another[1].*

Many 3G services today offer a fast and wireless internet connection for a monthly fee or a flexible cost depending on the monthly download traffic[2].However, many GSM services already offer free unlimited SMS traffic in Europe and North America among others, Although SMS is available for other mobile standards such as satelite, landline and ANSI CDMA networks we will only focus on GSM, as many people already have this technology in their pockets it could be used for a free wireless internet service that relies on this system By using a GSM phone that is constantly connected to the internet through an online PC or directly to a router through Wi-Fi, the phone could be used as a server to redirect the internet connection to any client(another phone) that requests a web page by stating the URL address. The web page would then be translated and sent back to the connected client as an SMS, when the client receives the SMS it is  translated back to an HTML page and viewed on an HTML-viewer or a browser control. In this experiment we have chosen to only send back the HTML content of the requested website, the client will for example not be able to see any pictures or flash animation in the browser but purely the the rendering of  Java scripts and HTML tags.

## 1.1   Other goals

This technology can of course be used for other perhaps more practical applications such as games, information services or controlling systems. Regarding the information services there already many similar concepts in use, such as the yellow pages and weather information[3]. Gaming is very uncommon if not obsolete, most likely because of the SMS speed being so slow as it is, regardless a small Tic-tac-toe game over the SMS network is available from our website for downloading, the game has the same underlying concept and programming as shown in this report.


Further down the road this concept can be used to transfer word documents, excel files and perhaps even power point presentations from one phone to another over the SMS system. This can come in handy if you suddenly realize you forgot a certain file but are on a train and cant access a Wi-Fi hot spot. You simply call a friend to send it over by SMS for free.

## 1.2   GSM Service

As for the GSM service, in this experiment we have chosen to use two Sim-cards from Tele2 Comviq, one for each phone, their telephone plan offers free unlimited SMS traffic for a month after a refill, this is however not ideal as the idea is wireless internet that is free. Of course the only de-facto charge is the server Sim-card as the client Sim-card is in fact your own personal phone network and is not seen as an added charge for the end-user. There are however other services that offer free SMS traffic regardless of Sim-card balance and expiration.

## 2  Server and Client

When speaking in terms of server and client we are actually referring to cellphones, one(server) being connected to the internet and hosting the network and the other being the end-user and client from which requests for web pages are sent and received. The server is as mentioned bellow, always connected to the internet through Wi-Fi or USB cable to an online PC. The client has a custom internet browser that sends and receives text messages and renders them as websites while the server has an equal application but that also downloads websites and supplies them to the client.

### 2.1  Relation

The server software is a small command prompt that receives and sends messages back and forth. When the server phone receives a text message, the body of the message is read and filtered, if the body text starts with the string "http://" then it is an accepted URL address and the server recognizes the sender as a client requesting a website, the server application prompts the requested URL on the screen and downloads the HTML code of the web page from this address, the HTML code is then sent back as an SMS to the client by using the senders phone number.

The Client receives the HTML content code and quickly renders it in the HTML-viewer control, the web page is shown on the screen without ever connecting to the internet. Se Figure 1.
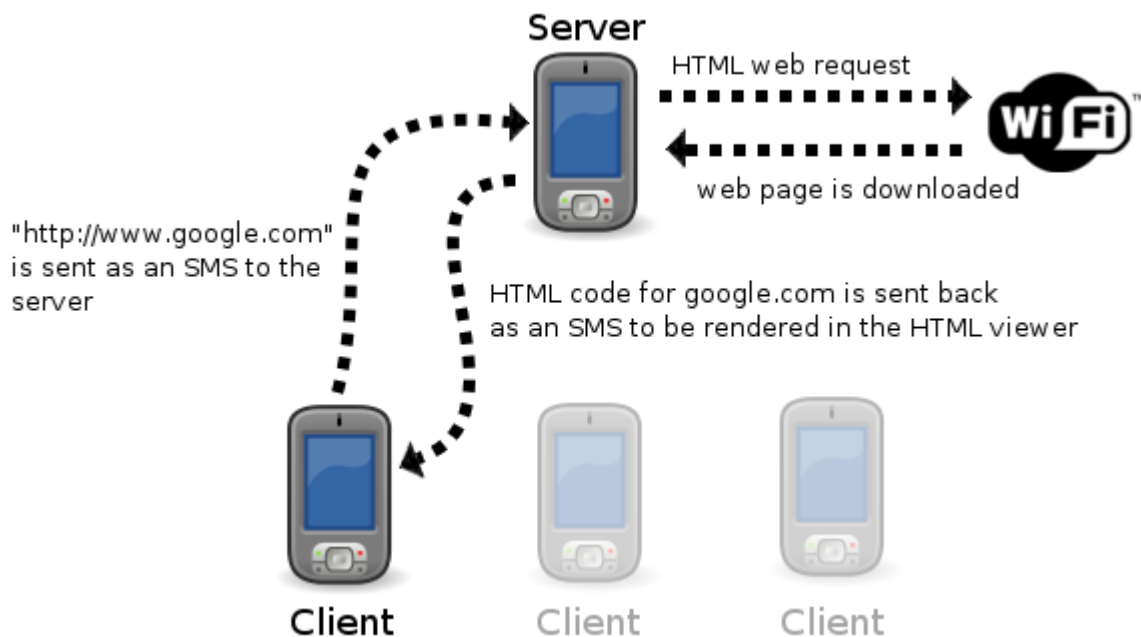


*Figure 1*

### 2.2  Software

For this experiment we chose to use two smart phones from HTC, P3600. As they run windows mobile 5[4]. It was easy to program the server and client application with visual studio 2008, by installing the .Net Compact Framework 3.5. The Language of programming used was C# as most tutorials and samples are written in C#, they can however easily be converted to VB.NET. The HTC P3600 also has Wi-Fi ability and can therefore be used as the server, as it relies on some internet connection to download the web pages. The 400mhz processor[4] made it also easy to render the web pages much faster then regular phones, however this technology can be used to supply free WAP-websites(Wireless Application Protocol)[5]  for regular cellphones at a reasonable speed.

### 2.2.1 Server

The server GUI(graphical user interface) is a command prompt that keeps track of what is sent and received. In Figure 2, you can see that it received a request for the website "http://www.google.com" and then continued by downloading the HTML source for what ever the domain redirected it to. In this case the home page for Google. The features has not been stressed as this is purely an experiment but one could of course add features such a progress bar and perhaps interaction with other servers in case of overload.
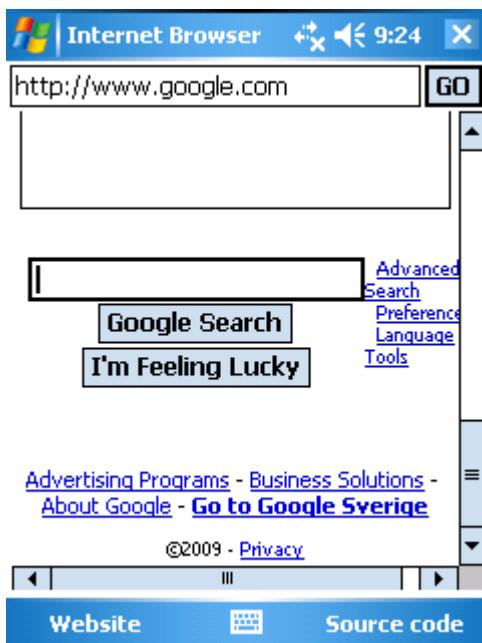
An interesting idea is to supply every client with a list over all other users, perhaps through a server like this one, then all the other users/clients can function as servers. A client could request a web page and it would contact all the other clients to see if anyone can function as a server(if a client is connected to the internet). If five or more client do have internet connection(perhaps through Wi-Fi) it could ask which of them is least active or busy and then have that phone send the web page. This way the load is divided on all the users of the system. So the server concept can actually function as a client as well, making the application much more dynamic and the system stronger and more flexible.



*Figure 2*

### 2.2.2 Client

The client is the phone/device that requests and receives the web pages. The application for it should therefore look similar to a web browser. The URL address is typed in the upper text box, called the address bar and the "GO" button sends the SMS containing the requested address to the server. In this experiment the phone number for the server was a constant but it might as well have been a variable that one could change in a hypothetical preference menu, one could request from a major server the list for all the other servers and add them to the server list as well, but as this was a basic send and receive experiment, this was not implemented. Figure 3 shows the result from a web request/browsing for the website "http://www.google.com". As you can see, the web page lacks any pictures such as the infamous Google logo on top of the search bar. This is simply because only the HTML source is sent, which is quite enough for many mobile users who quickly want to check the stock, weather, schedule but even though it might seem far fetched, the transfer of pictures through SMS is quite easy to implement and there are many examples of it working today, such as MMS(Multimedia Messaging Service) that uses the WAP(Wireless Application Protocol). Even though this wireless "internet SMS" seems to be quite worthless, we must keep in mind that it can be achieved free of charge.



*Figure 3*

# 3   The Experiment

For the experiment we wanted to try the system with Wi-Fi to avoid connecting the server first to a computer and then to the internet. Two HTC P3600 phones were used, The server phone had its Wi-Fi activated and connected to a router with an internet connection with 2MBit/s. The server program was  launched and kept running waiting for an incoming SMS. We then took the client phone and launched the "internet browser" client program. After requesting to view several web sites with success we decided to measure the time it took for the server to send the page to the client and how it is relative to the size of the web page, we did this to understand better the speed of this SMS traffic. See Table 1 for results. The numbers most likely differ depending on how good the phone reception is but the average speed according to the graph is 10 bytes per second, however this does not include text messages bellow 0.5 Kb.

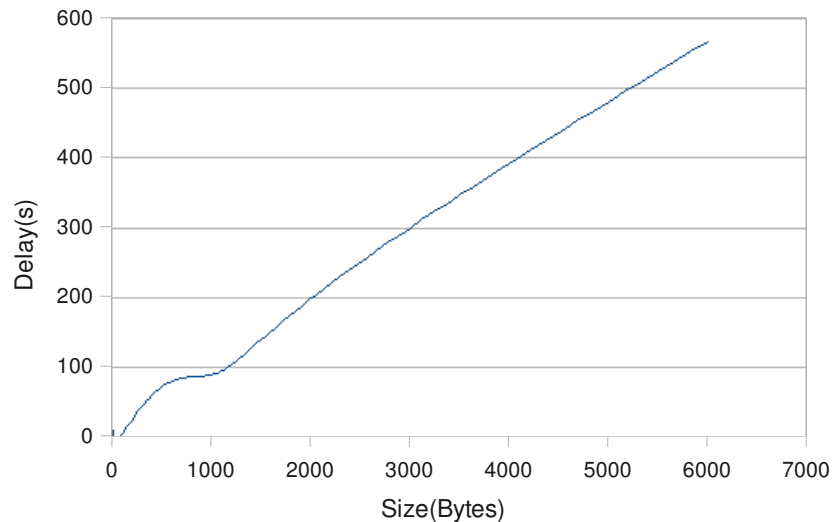| Package size | Delay time |
| --- | --- |
| 10 bytes | 10s |
| 100 bytes | 5s |
| 0.5 Kb | 1m 13s |
| 1 Kb | 1m 30s |
| 1.5 Kb | 2m 20s |
| 3 Kb | 5m |
| 6 Kb | 9m 27s |



*Table 1*                              *Diagram 1*

# 4   Criticism

During the experiment it became clear that this was not a functional system to use, and some critics might even claim that this is not a fully free service and that one could get the much better and faster 3G-internet offer for the same price.

Of course we never intended to achieve free internet, the goal was to build a *wireless* free service that would be free of charge. The service of being *wireless* is free, as for the internet, maybe some day.

Although this project might not be as successful as one would have hoped, it certainly opened a world of opportunities to explore. The same source code, same application can now transfer MMS-sized pictures for free, an MMS picture is usually 6Kb big and that takes 10 minutes to send. So the originally expensive service of MMS is now free. Multi-player games such as chess, tic-tac-toe, queen among others, can now be played online for free. Hopefully these things will be available through AdSa Life Development soon. If you feel yourself interested, please visit adsalife.com.

# 5    References

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[3] Google, "Google Mobile - SMS", http://www.google.com/intl/en_us/mobile/default/sms.html, (2009-01-13)

[4] GSMArena, "HTC P3600 - Full phone specifications", http://www.gsmarena.com/htc_p3600-1694.php, (2009-01-13)

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