3G

& the Internet

A Quick Guide

Introductory Level

Designed for iPad. Applicable to other devices.

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GUARDRAIL Tutorials

What is 3G?

Third generation mobile phone technology, supporting data transfer rates of at least 200kbps. Later upgrades also provide mobile broadband access of several megabits per second (Mbps). 3G is what we commonly use today on smartphones, mobile wireless broadband modems (USB adaptor or 'dongle' type) and wireless broadband routers. These are all now becoming available in 4G also.

1G - the old analogue mobile phone technology (1st generation early 1980s)

2G - early digital mobile phone technology, also allowed SMS messaging (early 1990s)

3G - superior conversion of voice and data to wireless signal with download speeds typically between 200 kbps and 20 Mbps (early 2000s)

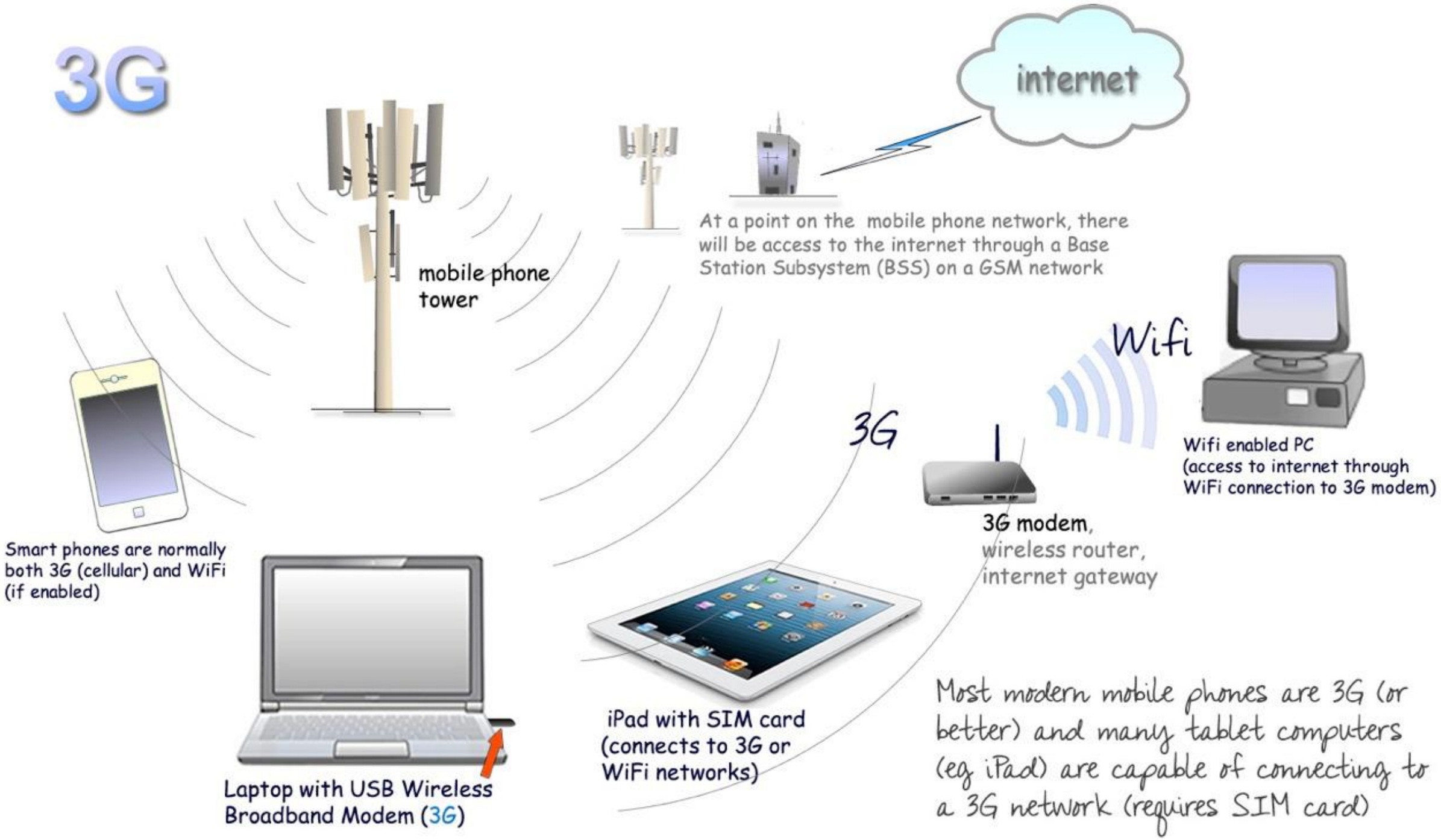
4G - normally faster than 3G with download speeds typically between 2Mbps to 50Mbps (early 2010s)

5G - almost unimaginable ... download speeds of up to one gigabit per second! (beyond 2020)

3G mobile allows fairly quick and reliable use of the internet over a mobile phone network. It is fine for typical usage such as emails, browsing, GPS and maps. Later upgrades to the technology allow for improved speed and reliability, as with HSPA (**H**igh **S**peed **P**acket **A**ccess), sometimes called 3.5G *(there is a 3.9G also, 'almost 4G').*

4G on the other hand, has the main advantage of allowing music and video streaming over a mobile phone network. If you have a 4G smartphone and are out of range of a 4G network, your phone will connect to an available 3G network. It will take a while for 4G to fully replace 3G, and it will only happen when it is widely accessible and affordable to most users.

Mobile Network



Connection Devices for 3G

- Controlled through **Settings** on any smartphone or tablet computer which is 3G enabled (SIM card required)
- On desktop and laptop computers a 3G internet connection is possible through a Mobile Wireless Broadband device (such as a USB 'dongle')
- Also available through a 3G Wireless Broadband Router (for sharing the internet connection over a small network)

Smartphones, since about 2007 are usually 3G and WiFi capable.

Many of the latest will be 4G and WiFi

Telstra Wireless Broadband (**Next G**) USB Adaptor provides advanced 3G connectivity.

Latest version combines both 4G and WiFi

Telstra Wireless Broadband Router (**Next G**) provides advanced 3G connectivity and WiFi.

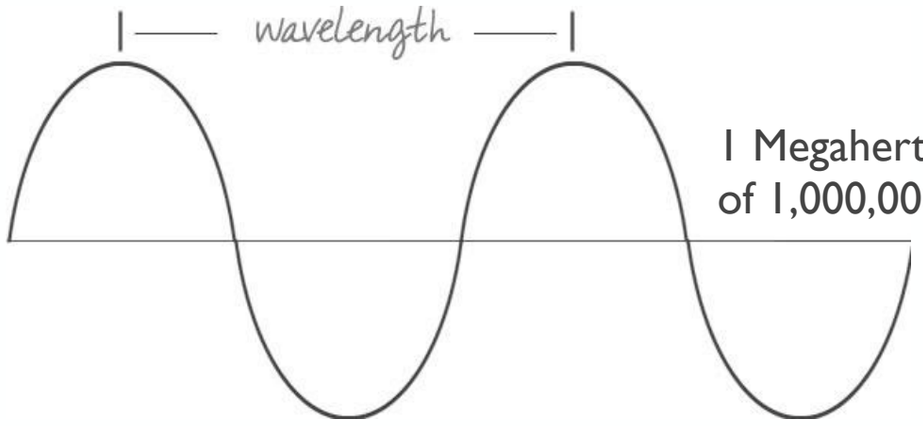
Latest version combines both 4G and WiFi

3G Standard?

There is no single 3G standard. A current mobile phone technology which provides a peak data transfer rate of at least 2 Mbps can be classed as 3G.

The term 3G is an oversimplification of a range of technologies that are defined in various ways. In Australia, mobile phone networks usually use the following UMTS/HSDPA or WCDMA frequencies.

- 850 MHz
- 900 MHz
- 1200 MHz



1 Megahertz equals a frequency of 1,000,000 cycles per second

UMTS (**U**niversal **M**obile **T**elecommunications **S**ystem) is based upon GSM (**G**lobal **S**ystem for **M**obile Communications). UMTS phones use a SIM (**S**ubscriber **I**dentity **M**odule) which is a GSM technology.

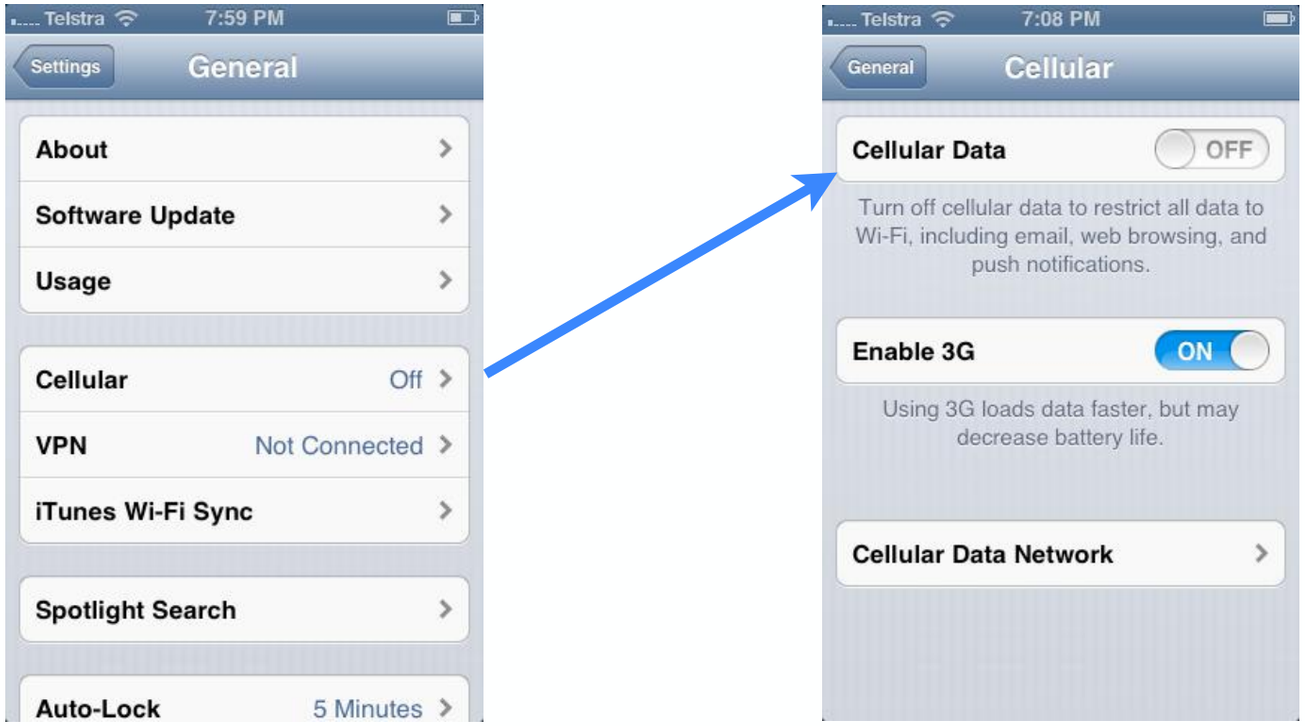
3G networks:
- are built upon the UMTS standard
- use WCDMA channel access
- utilise HSDPA or HSPA for data connections

Cellular Internet

Internet access over a mobile phone network allows us to to view web pages online without requiring a computer attached to a phone line, or internet gateway router. Now we can simply connect to the internet using our mobile phone over a 3G network (pending a few limitations).

Now, just because this is possible doesn't always mean it is a good idea! Data costs more over a mobile phone network, especially if you are travelling overseas away from your local carrier. If 'cellular data', 'mobile data' or 'data roaming' are turned on, you may incur some unwelcome charges after your phone connects automatically to another carrier's network overseas. It is always best to check with your carrier (service provider) regarding minimising your mobile phone costs when travelling overseas. In a lot of cases it is best to buy a SIM card for a provider's network within the country you are travelling in. It pays to ask!

Cellular Data Settings - IOS



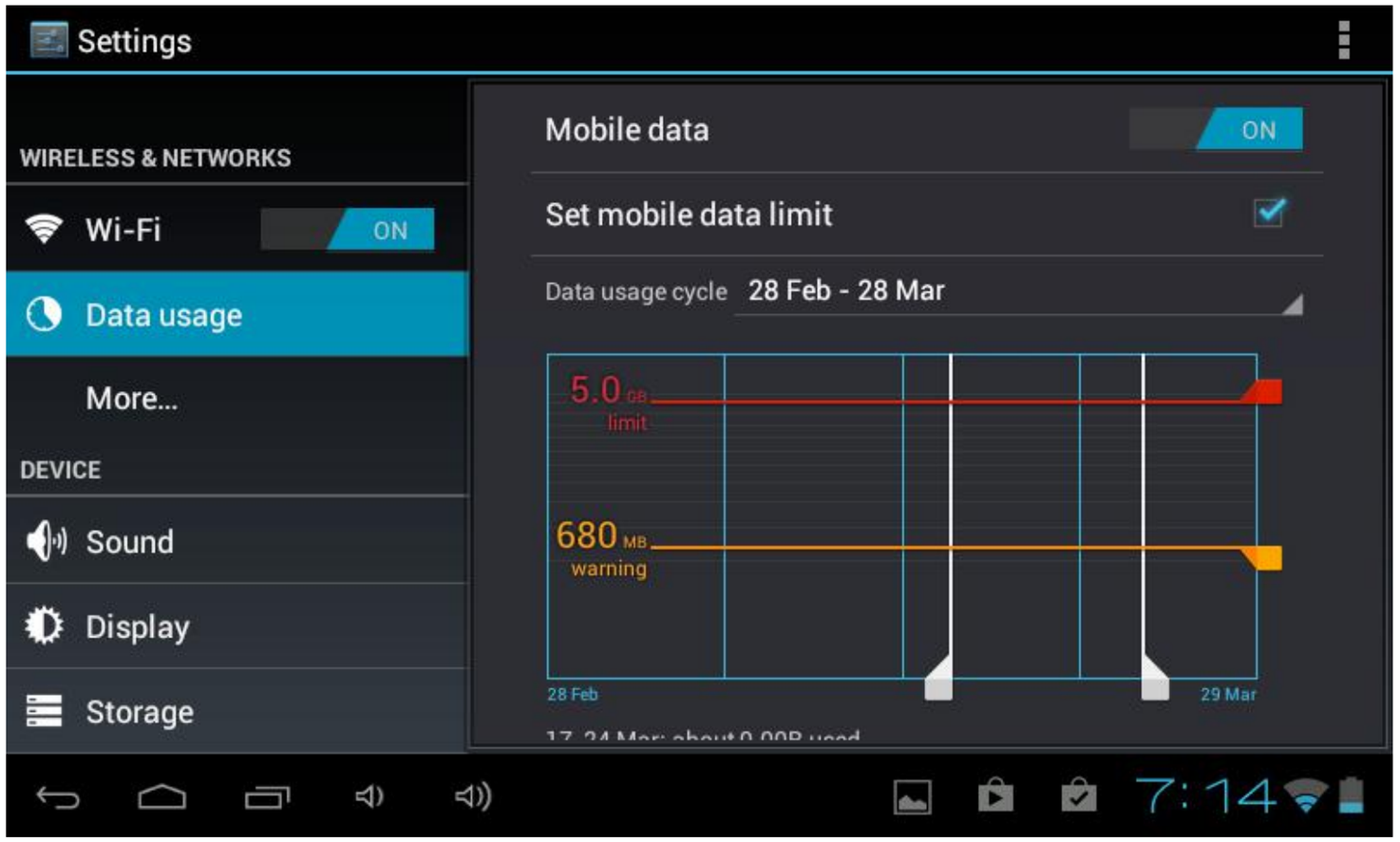
IOS devices (iPhone and iPad) should be similar to these screen shots.
(iPhone 3GS - IOS version 6.1.6)

The settings for the device are normally accessed from a **Settings** icon on the Home Screen. Under 'Settings' tap 'General'. Then tap 'Cellular'. If you choose to access the internet and download data over a mobile phone network (3G/4G) then move the 'Cellular Data' slider to ON (if it is OFF).

If on the other hand you do not want to use 3G and have access to a WiFi network, then make sure the slider is in the OFF position (and ensure that the Wi-Fi slider is ON under the Wi-Fi settings).

If both **Cellular Data** and **Wi-Fi** are OFF, you will get this pop up message if you try to use the internet to open a web page, access email or use any other service that requires an internet connection.

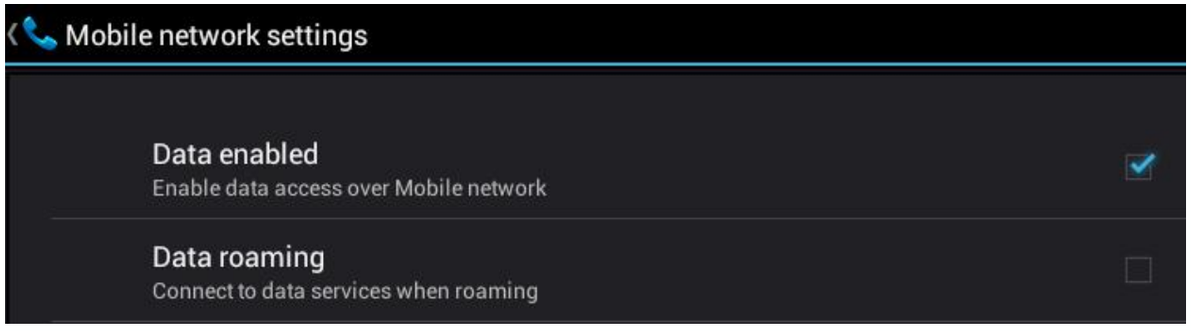
Cellular Data Settings - Android



Most Android devices (smartphones or tablets) should be similar to this.
(Amicroe TouchTAB II - Android version 4.0.4)

The Settings for the device are normally accessed from a **Settings** icon on the Home Screen. Under 'WIRELESS & NETWORKS' → **Data usage** → Mobile data can be turned ON or OFF.

Set mobile data limit (when checked) allows the user to define limits of usage within a given date range using sliding markers. A warning threshold can be defined, as well as a maximum limit.



Data access over a Mobile network, and data roaming can be disabled using the settings listed under **More...**

What is 4G?

Australia

Fourth generation of mobile phone technology, requires a peak speed 100 Mbps for high mobility communication (such as from trains and cars) and 1 Gbps for low mobility communication (such as pedestrians and stationary users).

Normally WiMAX, HSPA+ and LTE are considered **4G**.

Telstra has launched the first 4G network (FD-LTE) in Australia (2011), with estimated speeds of between 2 to 100 Mbps operating on the 1800 MHz band.

Optus has established a 4G (FD-LTE) network also on the 1800 MHz band (plus a 2.3 GHz network after acquiring Vivid Wireless in 2012)

Vodafone has also established a 4G (FD-LTE) network and continues expansion.

Apple iPhone 7

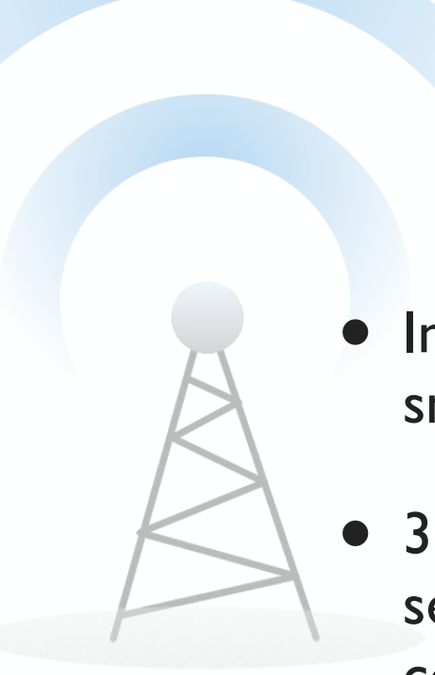
Samsung Galaxy S7

Sony Xperia XA 4G

Huawei P9

HTC ONE X9

Some examples of 4G mobile phones



SumminG Up

- Introduced around 2001, 3G really took off with the introduction of smartphones from about 2007 (when Apple released the first iPhone)

- 3G provides the data throughput necessary for accessing web pages and services over the internet using mobile devices such as smartphones, tablet computers (such as the iPad) and other devices that are 3G enabled

- 3G networks are built upon the UMTS standard. They have a peak data transfer rate of at least 2 Mbps, and in Australia utilise the 850 MHz, 900 MHz and 1200 MHz band (range of frequencies)

- Connecting to the internet over a mobile phone network usually costs more than using other methods (such as cable or WiFi) and does carry similar security risks that apply to WiFi

- The device settings for controlling the way your device accesses the internet are normally accessed from a **Settings** icon on the Home Screen of whichever type of mobile device is being used

- 4G will eventually replace 3G, but it will time, because currently the 3G technology is sufficient and affordable for most users

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