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# iPhone keeps record of everywhere you go

Privacy fears raised as researchers reveal file on iPhone that stores location coordinates and timestamps of owner's movements

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**Charles Arthur**guardian.co.uk, Wednesday 20 April 2011 14.06 BST

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Apple's iPhone saves every detail of your movements to a file on the device. Photograph: Linda Nyland for the Guardian

Security researchers have discovered that Apple's iPhone keeps track of where you go – and saves every detail of it to a secret file on the device which is then copied to the owner's computer when the two are synchronised.

The file contains the latitude and longitude of the phone's recorded coordinates along with a timestamp, meaning that anyone who stole the phone or the computer could discover details about the owner's movements using a simple program.

For some phones, there could be almost a year's worth of data

stored, as the recording of data seems to have started with Apple's iOS 4 update to the phone's operating system, released in June 2010.

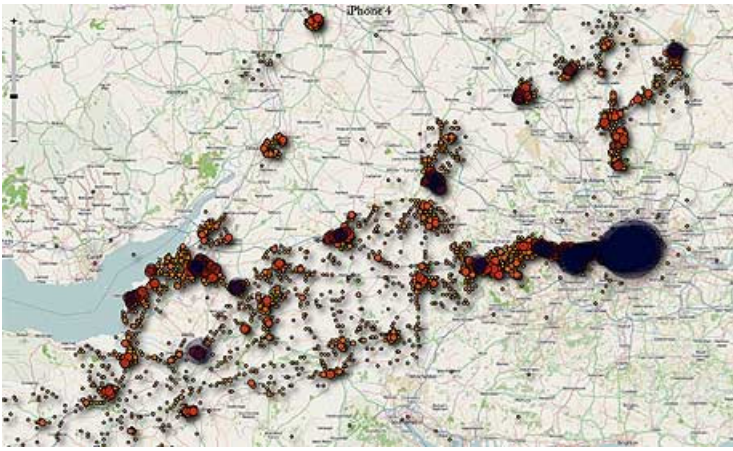
"Apple has made it possible for almost anybody – a jealous spouse, a private detective – with access to your phone or computer to get detailed information about where you've been," said Pete Warden, one of the researchers.

Only the iPhone records the user's location in this way, say Warden and Alasdair Allan, the data scientists who discovered the file and are presenting their findings at the Where 2.0 conference in San Francisco on Wednesday. "Alasdair has looked for similar tracking code in [Google's] Android phones and couldn't find any," said Warden. "We haven't come across any instances of other phone manufacturers doing this."

Simon Davies, director of the pressure group Privacy International, said: "This is a worrying discovery. Location is one of the most sensitive elements in anyone's life – just think where people go in the evening. The existence of that data creates a real threat to privacy. The absence of notice to users or any control option can only stem from an ignorance about privacy at the design stage."

Warden and Allan point out that the file is moved onto new devices when an old one is replaced: "Apple might have new features in mind that require a history of your location, but that's our speculation. The fact that [the file] is transferred across [to a new iPhone or iPad] when you migrate is evidence that the data-gathering isn't accidental." But they said it does not seem to be transmitted to Apple itself.

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Map shows

location data collected from an iPhone that had been used in the southwest of England

Although mobile networks already record phones' locations, it is only available to the police and other recognised organisations following a court order under the Regulation of Investigatory Power Act. Standard phones do not record location data.

MPs in 2009 criticised the search engine giant Google for its "Latitude" system, which allowed people to enable their mobile to give out details of their location to trusted contacts. At the time MPs said that Latitude "could substantially endanger user privacy", but Google pointed out that users had to specifically choose to make their data available.

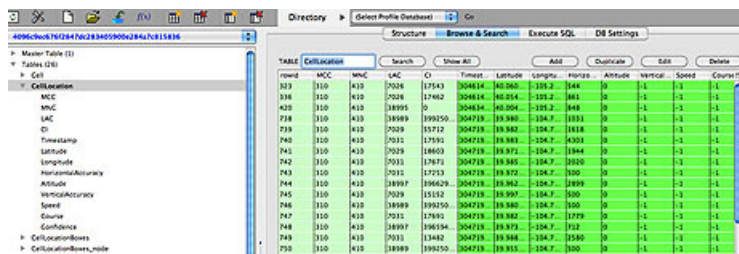
The iPhone system, by contrast, appears to record the data whether or not the user agrees. Apple declined to comment on why the file is created or whether it can be disabled.

Warden and Allan have set up a web page which answers questions about the file, and created a simple downloadable application to let Apple users check for themselves what location data the phone is retaining. The Guardian has confirmed that 3G-enabled devices including the iPad also retain the data and copy it to the owner's computer.

If someone were to steal an iPhone and "jailbreak" it, giving them direct access to the files it contains, they could extract the location database directly. Alternatively, anyone with direct access to a user's computer could run the application and see a

visualisation of their movements. Encrypting data on the computer is one way to protect against it, though that still leaves the file on the phone.

Graham Cluley, senior technology consultant at the security company Sophos, said: "If the data isn't required for anything, then it shouldn't store the location. And it doesn't need to keep an archive on your machine of where you've been." He suggested that Apple might be hoping that it would yield data for future mobile advertising targeted by location, although he added: "I tend to subscribe to cockup rather than conspiracy on things like this – I don't think Apple is really trying to monitor where users are."



rowid	MCC	MNC	LAC	CI	TimeStamp	latitude	longitude	altitude	speed	course
333	310	410	7016	17543	304614	-80.254	-185.2	1647	0	-1
336	310	410	7026	17462	304614	-80.254	-185.2	1647	0	-1
420	310	410	38995	0	304614	-80.254	-185.2	1647	0	-1
738	310	410	38999	199250	304719	-185.840	-184.7	1653	0	-1
739	310	410	7029	15712	304719	-185.840	-184.7	1653	0	-1
740	310	410	7031	17592	304719	-185.840	-184.7	1653	0	-1
742	310	410	7029	18609	304719	-185.872	-184.7	1644	0	-1
742	310	410	7033	17871	304719	-185.840	-184.7	1650	0	-1
743	310	410	7031	17733	304719	-185.872	-184.7	1650	0	-1
744	310	410	38997	199209	304719	-185.862	-184.7	1650	0	-1
745	310	410	7029	15152	304719	-185.867	-184.7	1650	0	-1
746	310	410	38989	199250	304719	-185.840	-184.7	1650	0	-1
747	310	410	7031	17895	304719	-185.840	-184.7	1650	0	-1
748	310	410	38987	199194	304719	-185.872	-184.7	1652	0	-1
749	310	410	7031	13482	304719	-185.840	-184.7	1650	0	-1
750	310	410	38989	199250	304719	-185.815	-184.7	1650	0	-1

The data inside the file containing the location and time information. This is used to plot the map above

The location file came to light when Warden and Allan were looking for a source of mobile data. "We'd been discussing doing a visualisation of mobile data, and while Alasdair was researching into what was available, he discovered this file. At first we weren't sure how much data was there, but after we dug further and visualised the extracted data, it became clear that there was a scary amount of detail on our movements," Warden said.

They have blogged about their discovery at [O'Reilly's Radar site](#), noting that "why this data is stored and how Apple intends to use it – or not – are important questions that need to be explored."

The pair of data scientists have collaborated on a number of data visualisations, including a [map of radiation levels in Japan for The Guardian](#). They are developing a [Data Science Toolkit](#) for

dealing with location data.

Davies said that the discovery of the file indicated that Apple had failed to take users' privacy seriously.

Apple can legitimately claim that it has permission to collect the data: near the end of the 15,200-word terms and conditions for its iTunes program, used to synchronise with iPhones, iPods and iPads, is an 86-word paragraph about "location-based services".

It says that "Apple and our partners and licensees may collect, use, and share precise location data, including the real-time geographic location of your Apple computer or device. This location data is collected anonymously in a form that does not personally identify you and is used by Apple and our partners and licensees to provide and improve location-based products and services. For example, we may share geographic location with application providers when you opt in to their location services."

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## Privacy invasions via technology

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### April 2011: iPhone location

British researchers on Wednesday revealed that iPhones (and 3G-enabled iPads) keep track of where you go, including timestamps, on a file that is backed up on your computer and shifted onto any new iPhone or iPad you get. Apple hasn't said why the file is created or whether the tracking can be prevented.

### October 2010: US Transportation Security Agency's X-ray scanners

The "porno scanners" (as they quickly became known) offered a clothes-free vision of people passing through the backscatter machines (whose level of X-ray exposure was also questioned). People who objected to going through those were obliged to go through remarkably intimate examinations – none of which endeared the TSA to air travellers.

## **April 2010: Google captures Wi-Fi data**

In a series of increasingly embarrassed blogposts over the course of April, May and June, Google admitted that while its cars were driving around to capture its (already slightly controversial) Street View pictures of locations around the world, it had also captured Wi-Fi network names – and data from the open ones, potentially including passwords and usernames. The dispute over whether Google should delete the data, and whether it had broken the law in various countries, rumbled on for months.

## **December 2009: Eric Schmidt**

In a speech, Google's then-chief executive Eric Schmidt suggested that: "If you have something that you don't want anyone to know, maybe you shouldn't be doing it in the first place. If you really need that kind of privacy, the reality is that search engines – including Google – do retain this information for some time and it's important, for example, that we are all subject in the United States to the Patriot Act and it is possible that all that information could be made available to the authorities."

His words provoked an outcry from privacy rights campaigners, who pointed out that privacy is a right, and that it protects every citizen from abuses by those in power.