

Privacy in the Modern Age, Part 3

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3 Phones

I was stopped at a stop light yesterday, and next to me, also stopped in the left-turn only lane, was a young lady in a sports car, looking down, clearly occupied with her phone. She was the fourth car in line, and when the left-turn arrow turned green, the first three cars made the turn, but she just sat there, updating her Facebook ["The New AOL"] page or something much more important than paying attention in traffic. Anyway, she happened to look up just as the arrow was turning yellow, so she accelerated from a dead stop and made the turn just as the arrow turned red. Fortunately, there was no one behind her in line.

People now seem to be obsessed with whatever crap is on their phone, but that is not the worst of it. The real problem is that people are now in the habit, a very bad habit, of storing important information on their "smart" phones. Your "smart" phone represents a very high risk to your privacy. First of all, it is likely that all "metadata" on all phone calls is being stored in some corporate or government database other than the phone provider. "Metadata" is information on: a) your phone number; b) the other party's phone number; c) both locations; d) time of day; and e) length of call. It is collected automatically by the phone service providers (usually for billing purposes), but we do not know if that data is sold, to or whom it might be sold to, or what it is used for. Marketing people can use metadata to target you for advertising, if the metadata determines that you call certain types of businesses. The police can use it to determine if two people know each other. Artificial intelligence algorithms are now in use that can use metadata in conjunction with public records to determine a person's identity, even if they only know the phone numbers. The data on the calls you make, and the calls made by your contacts, and the ones subsequently made by those parties will allow an algorithm can determine to what extent many different people are connected.

Second, text messages are eternal; they are stored by the phone provider and on your phone, along with any and all pictures. I like to watch the true crime ("dumb criminal") TV shows in which a woman kills her boyfriend's wife, then texts him, "Yup, I done killed her dead, I stabbed her 14 times and threw the knife in the dumpster behind the 7-11." You should regard text messages as being the equivalent of a billboard next to the interstate highway. They are never deleted by the phone provider, even if you delete them from your phone.

Third, if your "smart" phone has internet access, all the sites you visit and all your email messages are being stored by your provider, and also on your phone, same as on your computer. If your "smart" phone can take pictures, each picture is time-tagged along with the location of the phone when the picture was taken.

Fourth, we do not know who has access to all this metadata, and worse than that, we do not know who is recording our phone calls. What is the possibility that such data could actually be stored? Most phone calls end up on a communication channel that use the T-1 standard developed in the early 1960's. T-1 is a digital stream at 1.544 Mb/s that can handle 24 calls at 64 kb/s each (plus some additional timing and frame synchronization overhead). Since a byte is 8 bits, T-1 voice channels operate at 8 kB/s. Let's suppose you are on the phone for an hour a day. An hour is 60 minutes, each consisting of 60 seconds, for a total of 3600 seconds per hour. At 8 kB/s, an hour of recorded voice in digital format would require 28.8 MB of data storage. If there are 320 million people in the U. S. and each is on the phone an hour a day (assuming both two channels are required to obtain both sides of the conversation), the total storage requirement would be $9.216E+09$ MB per day, or $9.216E+15$ bytes per day. A terabyte (TB) is 1000 giga-

bytes (GB), and a GB is 1000 megabytes (MB). A terabyte disk drive can be purchased for about \$50 retail. Therefore a TB is $1.0E+12$, and thus 9216 one-TB drives would suffice to record in digital form all these phone calls. Multiply by 365 to get the storage requirement for one year: 3.364 million one-TB drives. It is not too hard to conceive of a data storage facility with this capacity, given the density of storage units. Recording and storing is the easy part; it is the indexing and accessing that would present a more difficult problem. But it doesn't matter: the fact that it can be done means that you should assume that it will be done, or maybe is already being done.

So, anyone with inside connections, or a cooperative agreement between your phone provider and the government, or your phone provider and a paying corporation, means that sooner or later, anyone who wants the content of your conversations and text messages will be able to get them. That is leaving aside the current capability of the police to obtain all this if they are granted a search warrant under probable cause. We do not know if there are any "secret" probable cause standards that may apply.

Once again, there is no reason to assume that corporations or governments (especially foreign governments) are abiding by their advertised "privacy" policies. You do not have the means to force them to prove it. You should assume they are not abiding by their stated privacy policies, and that any data they possess about you is at least being used for marketing purposes.

So, what can you do to improve your privacy position? You cannot prevent your phone provider from collecting metadata; that is written into the contract. But you can do several other things:

- a. Get rid of your "smart" phone and go back to the dumbest phone you can find.
- b. Stop texting; if it's not important enough to talk to someone about, it probably isn't important enough to bother them with. Go back to having normal conversations like humans are meant to do.
- c. Use your dumb phone to make one or two wrong number calls each day; completely random.
- d. Even if your dumb phone has camera capability, do not take pictures with it. Buy a separate camera for pictures.
- e. If you must have a "smart" phone, use encryption.
- f. No matter what kind of phone you have, turn it off most of the time and use pre-arranged times to turn it on and call people.
- g. Go back to a house phone and minimize the use of mobile phones (if you can afford the extra charge).
- h. Ward off "junk" phone calls by answering them with greetings like "Alien Abduction Hotline", "Bigfoot Sighting Information Center", "Internal Revenue Service Audit Division", "Lucifer's Mortuary"; and "Ford Pinto Parts and Service". You get the idea.