

Cell phones can relay other people's calls

The telecom industry is introducing a new technology that can route telephone calls through unsuspecting people's cell phones. This can increase the radiation load without people knowing it.

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What is LTE Direct?

When a call is made from a cell phone, it is normally relayed through one or more cell towers. With the new LTE Direct¹ technology, the towers will no longer handle all the calls.

If two cell phones are within 1500 ft (500 meters) of each other, the phones can transmit directly to each other without a tower acting as a relay station.

If the two cell phones are further apart, but still in the same area, they can use one or more cell phones as relay stations. This relay method is intended to be used in areas where there is no cell service, such as remote areas or in case the local tower is overloaded or not working (damaged or lost power). This relay feature appears to be similar to the mesh technology used by some smart meters.

Why this new feature?

LTE Direct was developed in response to the 2012 Superstorm Sandy, which knocked out half of the cell towers in some areas of the Atlantic coast.¹ This highlighted the vulnerability of cell towers compared to landlines. As the American telecom industry is actively trying to kill off the landlines (even trying to get them outright banned²), they needed to address the reliability problem.

Another obvious reason is that LTE Direct can offload local calls from the towers, which saves money for upgrades. It may even save installing some new towers.

Rollout of LTE Direct

It will take a few years for LTE Direct to be fully available. The new standard is expected to be finalized by the end of 2014. Then the cell towers will gradually be upgraded with new software, so they will not "butt in" when no longer needed. Cell phones will also need to be replaced or upgraded to be able to use LTE Direct.

Commentary

Relaying calls through unsuspecting people's cell phones is a can of worms. If the person is carrying the phone, then she will be irradiated just as if she was actively making a call. If she makes her own calls while holding the phone away from her body (to minimize the radiation), then these relay calls can impart stronger radiation than her regular calls, without her knowledge.

This relay feature is similar to what is used by mesh smart meters. In a mesh network, all the parts (whether cell phones or smart meters) will need to keep track of all their neighbors, so they know which ones can be used as relay stations. With cell phones, this is more complicated than with smart meters as cell phones move around. This means a lot of transmissions to keep track of.

When a call is actively being relayed, each phone in the chain has to constantly be ready to switch to other relay phones, in case one of the phones moves further away or is turned off. This means all nearby phones must constantly be kept track of, and queried as to which other phones they are able to talk to.

In a court-ordered disclosure,³ the utility company PG&E admitted that their mesh smart meters transmit 9600 times a day on average in order to read their meter data six times a day. This illustrates how transmission-intensive mesh networks are.

There can be some legal issues with such a system. Is it legal to use someone else's cell phone without permission? Is it legal to drain down their battery, since transmitting uses much more power than standby?

Once most cell phones have this relay feature, who knows what it can be used for that has not been thought of yet. In 2013 the city of Santa Clara started using their mesh smart meters to also carry Wi-Fi internet traffic,⁴ which was probably not thought of when the meters were first installed.

The feature where two nearby cell phones talk directly to each other seems benign compared to the relay. The radiation of the users will probably be similar to when a tower is used as the middleman.

Avoiding LTE Direct relay

The relay feature is probably not going to be used much in urban areas for a while, unless there is an emergency or the towers are overloaded.

The makers of the cell phones will probably not allow people to turn off the relay function, unless there is a public outcry. If many people turn it off on their phones, it will not be available to route calls during an emergency.

One strategy is to keep using a pre-2015 phone. Cell phones are considered obsolete within a couple of years, but for basic phone use most phones can be used for a decade or more.

It is always a good idea to reduce the radiation by keeping the phone in a purse or bag instead of in a pocket. Even better is to keep it powered off. Always keep them away from children and pregnant women.

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References

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4. *Santa Clara uses smart meters to create citywide free Wi-Fi*, Martha Mendoza, Associated Press/Christian Science Monitor, March 27, 2013.