

NEWS

Why Haiti's Cellphone Networks Failed

Haitian engineer Charles-Edouard Denis describes the cellular landscape before and after Haiti's quake



Photo: Cris Bierrenbach/AP Photo

BY ANNE-MARIE CORLEY //
FEBRUARY 2010

19 February 2010—The earthquake in Haiti on 12 January demonstrated the country's [lack of robust building infrastructure](#), as well as the importance of [satellite-based Internet connectivity](#) and [amateur radio technology](#). The earthquake also highlighted the failure of Haiti's cellular phone infrastructure.

IEEE Spectrum has been corresponding via e-mail with a Haitian engineer, Charles-Edouard Denis, who helped build Haiti's first cellphone company, Haitel, and who describes the impact of Haiti's

cellular infrastructure before and after the earthquake hit Port-au-Prince.

IEEE Spectrum: Can you describe the cellular and landline phone infrastructure as it was before the earthquake?

Charles-Edouard Denis: Prior to the earthquake, there were three cellular companies and one landline company working in Haiti.

Teleco [the incumbent landline operator, 98 percent government-owned] had fewer than 100 000 lines, and only 30 percent were working before the earthquake. The company is in the process of being privatized, but because the government never reinvested profits into the company, it cannot compete with the cellular companies' aggressive marketing campaigns and quickly available service.

Haitel [the first cellular company, utilizing code division multiple access technology, or CDMA] was launched in March 1999 and deployed 3G in 2005; it covers about 200 000 subscribers.

Comcel [the second cellular company, with time division multiple access (TDMA) technology] was launched in October 1999 and deployed GSM in 2005 under the name brand Voilà; it covers about 1 million subscribers.

Unigestion Holdings/Digicel Haiti [the third and last cellular operator] was launched in May 2006 with GSM ; it covers about 2 million subscribers [the vast majority of cellphone users].

Most people in Haiti have two or three cellular phones, and they only pay as they go. If they don't have money, they can keep their service [receive calls] and replenish when they can afford it. This is also good for the phone companies because it allows them to terminate international calls to these customers.

Spectrum: How can people afford to have multiple cellphones?

Denis: Before Digicel came in 2006, cellphones cost US\$300 or \$400, but those who could not afford the phones often received used phones from their relatives in the United States or Europe and so were able to have multiple phones. Now phones cost about \$20, but service is 3 to 5 gourdes per minute (exchange rate now is 40 gourdes for \$1). Digicel and Comcel have done a great job of creating access virtually everywhere in Haiti. Phone service is a tool

used even by the shoeshine kids on the street of the capital, even the peasant collecting cocoa beans in faraway lands...

Spectrum: What happened immediately after the earthquake?

Denis: Right after the earthquake, the only company that was still working was Haitel, but its network was quickly overloaded. It remained operational mostly because it utilized almost exclusively 30- to 60-meter towers that are built to withstand hurricanes and earthquakes.

Digicel and Comcel were not operational at all, and since between the two they have more than 3 million subscriptions, a lot of people could not communicate.

Spectrum: Digicel reported after the earthquake that 70 percent of its base stations were working, and that it was trying to get the other 30 percent back up. With only 30 percent of the base stations down, why couldn't people make calls?

Denis: Those 30 percent were the ones centered in Port-au-Prince and the surrounding areas. The others were spread throughout the country, unaffected by the earthquake. The stations in Port-au-Prince failed because Digicel uses small towers on rooftops. A lot of houses that hosted Digicel antennas and sites were destroyed. That is why Digicel had a lot of problems covering the entire Port-au-Prince region.

Most of the people trapped under the rubble were trying to use their phones to call family members to let them know where they were, but the service was not available, and no one came to help them. At a quarter to five in the afternoon, some people were not at work. They left early to either stop at a friend's house or at a supermarket. So family members had a hard time identifying the location of their loved ones and therefore could not help. Since Digicel has more than 2 million subscribers, this lack of telephone service caused a lot of deaths.

Also, two of three Digicel switches [which connect and route calls from one place to another] are not working 100 percent. This has impacted most customers, since all the switches are located in Port-au-Prince. [Now] Digicel's voice and data services are working at 90 percent capacity compared to prior to the quake. Other business services are back up; for example bulk SMS services.

Spectrum: How are the other two cell companies doing?

Denis: Comcel has improved its service. Though Haitel was still in service during and after the quake, they subsequently had problems because they couldn't provide fuel to all the sites in the Port-au-Prince area, and had only a small team of engineers and technicians to manage the network. At one point [a week and a half after the earthquake], no Haitel customers could make calls, even if their lives depended on it—though they could receive calls from a Digicel or Comcel phone. Haitel applied a fix two weeks later, but their network coverage has still degraded significantly since then.

Spectrum: News outlets, including ours, have reported that there is only one undersea cable linking Haiti to the outside world and that this cable was damaged during the quake. Can you confirm this?

Denis: It is rare that an undersea fiber cable is damaged by an earthquake or by a tsunami; the cable is literally laid on the ocean floor, linking countries and continents. There is only one undersea cable in Haiti, and that's the one owned by Teleco, connecting it to the Bahamas. The fiber cable was a gift from BaTelCo, the Bahamian phone company, to Teleco, in 2004, but that fiber has yet to be commercialized due to the high costs involved. There are rumors that there is another cable in the south [Jacmel area], but that is not confirmed.

Most international communications go through satellite service or via microwave connectivity—equipment that produces sound waves to establish communication, just like a satellite antenna—via the Dominican Republic for undersea fiber-optic cable access, as it is less expensive [to use the Dominican Republic's cable] than the Teleco cable.

There are two major ISPs, which get their service through the Dominican Republic: Access Haiti—which has offered free VoIP lines for people who want to call loved ones in the United States, Canada, and the Dominican Republic during the crisis—and Hainet, which has done the same.

These two get Internet from microwave connectivity to the Dominican Republic, and their networks stayed up throughout the earthquake. [Note: [One report](#) suggests that these two ISPs did go down shortly after the earthquake, but the report is unconfirmed.]

Spectrum: How does microwave connectivity to the Dominican Republic work?

Denis: For microwave connectivity, you need antennas from two or more locations, looking at each other. This type of communication is very well suited to the Haiti landscape because it is very expensive to lay fiber cable or copper cable. On top of that, wireless microwave connectivity is not subject to vandalism like copper cables are.

Once the connectivity is established with the Dominican Republic via microwave, the carriers [CODETEL, etc.] in the Dominican Republic connect the other end of the microwave to the undersea fiber network landing in their territory.

Spectrum: What role does the government play in regulating telecommunications?

Denis: The government doesn't have its own network to communicate with the deconcentrated entities around the capital and around the country. They, just like us, rely on the regular cellular lines to communicate vital state information. They need to set aside some frequencies for their own usage, and they need to manage it themselves. Cellular companies make so much money that they rarely follow government mandate. The government has lost all leverage and doesn't have the expertise within its own structure to regulate the sector properly. Corruption is also a big factor.

Charles-Edouard Denis supervised the installation of Haitel sites in Haiti starting in 1999. After two years, he took over as head of operations, and in 2003 he became director of network operations, handling installation of new sites, operation and maintenance, and the international network. He left Haitel in 2007 to build his own company, TiVi, which aims to provide wireless digital cable TV. He had hoped the company would make headway this year, but he is no longer sure of the prospects for progress.

While he has arranged for his wife and children to stay in Florida until conditions improve, Denis remains in Haiti "to help out other people in need and think about the new reality of Haiti—the new future."

most recent comments

SATHIYAMOORTHY.K 02.26.2010

what is the reason behind the tel. company to bard their service.....

JOHANNE RATEAU 02.25.2010

Thank you Charles. I learned so much from this article. The revolution that Haitel started in 1999 is amazing. While I find myself quick to judge Digicel which was not able to perform when put to the test, I must also remember that these companies are private companies that have responded to a national need. That everyone could afford a cellphone is amazing (no matter the country); it is something that should be promoted. While this article shows that Haiti is a young country, Charles proves to us that there are expert Haitian engineers that the country can count on..

poloj11 02.25.2010

the earthquake was one of the most devastating natural disaster ever recorded all of us must agree but it also bring to light how the mismanagement of this contry at all level also on the lack of response for this disaster now it is time to rebuild the CNN, NBC, ... are gone but the Haitian problem is still standing and worsening day by day I hate the word Project but we need the blue Print of a "Port-au-prince Project" with knowlegable Guys Like Charlie to put forward New an viable Idea for the reconstruction of the capital The same people that bring this country t the ground are not suppose to be anywhere near of this project it is time to let them go eat their failure and start fresh with new set of eyes and brain this a Port-au-prince do over let ask The head of Haiti to start packing move politic out of the Picture and rebuild this Capital the way it supose to be once for all rebuilt yes but not with the 1957 crowd .

F. DENIS 02.25.2010

Very well said, Charles has provide a fair description of phone infrastructure in Haiti. Now I understand why it costs us so much to get in touch with our people in motherland..

PASCALE THOMAS 02.25.2010

A powerful insight and I hope the catalyst for solving an important issue for Haiti. I know that the cell phone service was a lifeline for us -- and it was hard trying to figure out what service would survive from one day to the next. With young engineers like Denis on the case there is hope!.

KEN TUSKIND 02.25.2010

From where did the cell system equipment that continued to function get its electrical power?

ERNS EXCEUS 02.25.2010

Excellent article. My comments: Teleco died a long time ago due to lack of investments and corruption. Also remember that most of the working lines are assigned to Government offices,(non productive as far as revenue generation). A lot of unused spectrum space is being parked into the Haitel license that could be used to make the industry more competitive

for the country. The country's spectrum map needs redressing in order to allow more entries ,and more investments in Telecom..

DAN LANDHERR 02.25.2010

I'm a little confused by this passage: "via microwave connectivity, equipment that produces sound waves" I think this deserves a little more detailed explanation. I believe he is talking about microwave line of sight communication. There are no sound waves involved, that is electromagnetic radiation. This communication could be upset by the earthquake also because it requires direct line of sight. Adjustments wouldn't be unusual after an earthquake..

RICHARD DIEUDONNE 02.24.2010

This article shows the importance given by the government and private companies to activities such as disaster recovery and business continuity planning. As usual, They went half inch on the subject and never bother to implement a solution. This earthquake has laid bare multiple abnormalities that have been impairing the Haitian economy..

PHILIPPE 02.24.2010

Very informative article..

PHIL MAGLOIRE 02.24.2010

I want to thank Charles-Edouard Denis for providing a very accurate description of the wireless landscape in Haiti. I think the recent earthquake in Haiti might have provided new opportunities to help strenghten the Haitian cellular networks. It was quite a nail biter and very painful for me living in the US and not being able to reach any of my relatives for days after the quake. Since there was no phone communication, I had to travel to Haiti via the Dominican Republic three days after the quake to go check on my parents and relatives..

MAJED ELWARDY 02.22.2010

Thats so good :) ... i want work in summer in hitiel ...

ADVANCED CLEANSE 02.22.2010

It will take some time to make Haiti a strong nation as its infrastructure is also weak. Its infrastructure needs to be rebuild so that it may bear the jostles of time. .