FA 01: Intelligence agencies target information highways

Submarine cables make the global information highways a reality. The newest spy scandal forces states to further expand their networks. Now, the idea of a European internet has been put forward.

Fiber optic cables have taken hold of the pole position with a share of 95 percent of worldwide data traffic, replacing satellite links. In the last 15 years numerous high-performance submarine cables were laid between continents, for the internet. Massive amounts of data stream through them. Full order books are a reason for various cable manufacturers to be happy. For intelligence agencies, for instance for the NSA, this enormous mass of data is a real paradise. In order to keep information secret, several states are now placing their bets on new cable links.

Continuous network expansion

Without submarine cables, there would be no global communications network. They transport vast amounts of phone calls and emails, make cable television possible and provide a fast internet. In order to meet rising demand and to reach new regions, the networks are being continuously expanded.

For outsiders, submarine cables appear to be unproblematic – cables laid in great depths appear to be risk-free. Yet they were never secure. Dangers already lurked in the past.

After all, cables withstand mostly currents and the high pressure levels of the deep sea. However, problems always pose themselves near the coast. Trawl nets and anchoring ships damage cables. For example, the anchor of a ship harboring in the port of Mombasa, Kenya, severed a submarine cable. As a consequence, large parts of East Africa were cut off from the internet.

Spying on the net

Sea quakes, currents and sandbanks can also create disturbances. Cables are also a target for attacks. Last year, divers planned on severing the SEA-ME-WE 4 submarine cable off of the coast of Egypt, a cable important for providing the internet connection between Europe, Southeast Asia, India and the Middle East.

On top of it all, whistleblower Edward Snowden last year revealed that spying activities, chiefly of the USA and Great Britain, had got out of hand. Spying was justified by claiming it was being done to fight terrorism and to warn of imminent attacks. However, many states were shocked by the full extent of intelligence gathering.
Even though modern fiber optic cables have replaced copper coaxial cables over the course of the last years, intelligence agencies were able to eavesdrop. Already at the turn of this millennium reports surfaced, claiming US submarines were tapping into these cables, which back then hardly appeared possible. Experts assume that fiber optic cables are also wiretapped on land. Especially amplifiers and nodes are seen as suitable targets.

Rich harvest

Fiber optic cables allow for a rich harvest, as they transmit a huge amount of data. Optical fibers transmit data as light impulses, nearly with the speed of light. Data rates of around 160 gigabit per second are currently standard, for a pair of optical fibers. Fiber optic cables thus remain essential for carrying data. Data rates are higher, and bandwidth is greater than what satellites can offer. This makes them economically viable, despite high costs for laying them under the sea.

Both phone calls and data are transferred over fiber optic cables. Despite strong tubing, they can be spied upon, to a certain degree. Where fiber optic cables are slightly bent, data can leave its path.

A small amount of optical information is, due to Rayleigh scattering. The emitted light can be captured by sensors, amplified and turned back into information.

Typical fibre optic cables are protected by a stainless steel tube, and are placed in a water blocking compound. On the outside, another layer of material protects the cable from salt water. Layers of steel wires covered by plastics add further protection. A layer of copper foil can also be employed. Hybrid cables also feature a copper cable.

Tapping into submarine cables

Cable system TAT-14 made the headlines during the wiretapping scandal, a system owned by German telco Deutsche Telekom. A large part of German overseas communication uses this system.
The 15.000 kilometer long cable runs twice through the North Atlantic and connects Europe with the USA. Four fibre optic pairs with 640 GBit/s SDH capacity and a total design capacity of 3.2 Bit/s. British signals intelligence agency GCHQ gained access to TAT-14 as part of the Tempora program, English newspaper "The Guardian" reported. In turn, US intelligence agency tapped submarine cable Sea-MeWe 4, which is 18.800 kilometers long and connects France with Singapore. Dense Wavelength Division Multiplexing (DWDM) is used to increase capacity of the fibers, using different wavelengths to transmit data.

New connection – without the USA

Data is routed nearly completely over US networks. "We need to respect privacy, human rights and the sovereignty of nations," Brazilian president Dilma made clear. Furthermore, she stated industrial espionage was undesired. A plan has therefore been made to create a direct connection between Europe and Brazil through a submarine cable. Cable laying will start in summer 2014, the 185 million dollar expensive project spanning 8,500 kilometers

is to be completed 18 months later. The aim is to make it a lot more difficult for the US to tap the cable.

Finland also wants to protect itself against spies through a new submarine cable. The cable is to be laid across the Baltic Sea and is supposed to link the Scandinavian country with Germany. The background is that Sweden, Finland's neighbor, has been allowing foreign data traffic to be tapped, since a couple of years. Finnish minister Pekka Haavisto sees “Sweden spying,” the neighboring country is viewed as a tool for foreign agencies. So far, the only internet cable runs through Sweden, Finland wants to change the situation. A new cable needs to be laid.

A “European internet”

First, a global network of high performance cables was rolled out. Now, further cables will be installed, to bypass the USA and its control of data flows. The cable market remains on the move, even though the reasons are unfortunate. In Europe, the spy scandal has meanwhile given birth to the idea of an internet of its own.

The fastest route so far was across nodes in the USA or Asia, which made it easy for intelligence agencies to listen in and spy. Now, views have changed. “In light of the data scandals it not only makes economic sense for us to reduce our dependency from America,” Austrian EU commissioner Johannes Hahn said in an interview with German newspaper Frankfurter Allgemeine Sonntagszeitung. German chancellor Angela Merkel also sees need for action. Talks with French president François Hollande also included new routes for cables. The chancellor stated “it is unnecessary for one's emails and so on to pass over the Atlantic, communication networks can also be created within Europe”. Should such a network be constructed, data originating in Germany would be transmitted over cables within Germany.

The trump card

As a product, cables will not only continue to play a central role for the expansion of the internet, but also as a trump card to prevent espionage. The silver bullet, the development of spy-proof cables, appears to be far in the future.

Innovations in the fields of wire and cable will be presented at wire Düsseldorf, taking place from April 4 to 8, 2016 at Düsseldorf fairgrounds.

Press Contact wire 2016:
Petra Hartmann-Bresgen M.A.
Kathrin Kleophas van den Bongardt
☎ +49 (0)211/4560-541
☎ +49 (0)211/4560-544
🖹 +49 (0)211/4560-87 541/-87 544
🖮 HartmannP@messe-duesseldorf.de
🖮 KleophasvandenBongardtK@messe-duesseldorf.de