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German Expert: RFID Chips In E-Passports Can Be Cloned

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by Dan Nicolae Alexa

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E-passports were invented with the sole purpose of ensuring a better protection of personal data, by incorporating radio frequency identification. Now it seems they are the Achilles heel in this area.

Radio Frequency Identification (RFID) is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be attached to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Chip-based RFID tags contain silicon chips and antennas. Passive tags require no internal power source, whereas active tags require a power source.

Electronic passports are to be introduced in the US starting this October and have already been present in some European countries. But at the Black Hat security conference in Las Vegas, a German researcher has demonstrated that passports embedded with radio frequency identification (RFID) chips can be easily cloned.

Lukas Grunwald, who is working for DN-Systems in Hildesheim, Germany demonstrated that he could access data stored in the RFID chip in his own passport and then copy it to another RFID chip.

"The whole passport design is totally brain damaged," Grunwald told Wired. "From my point of view all of these RFID passports are a huge waste of money. They're not increasing security at all."

The most intriguing aspect of Grunwald's demonstration is that he was able to develop his method of accessing RFID data from his passport by using a laptop, a standard RFID reader and a basic smart card writer. Grunwald has spent two weeks and \$5000 dollars to complete his project.

"You can add RFID in a secure way, but especially in electronic passports the standards are created by compromise, and by compromise you can not do it securely," Grunwald said, quoted by CNET.com "You need a lot of research to do it right, and that research is not done right now."

The good news is that even Grunwald managed in cloning the document, he stated that it is quite impossible to change the data (such as birthday and name) on the chip without being detected, because the passport uses cryptographic hashes to authenticate the data.

The Grunwald's demonstration is not a singular case. Last month, at the HOPE Number Six conference in New York City, Annalee Newitz and Jonathan Westhues have proved that RFID chips from VeriChip can be easily cloned. To clone the chip, Westhues has used a standard RFID reader and a homebrew antenna connected to his laptop, which recorded the signal off the chip.

In February this year a Dutch security firm has demonstrated that the data exchange between the RFID reader and passport may be intercepted, stored, and then was cracked later giving full access to the digitized fingerprint, photograph, and all other encrypted and plain text data on the RFID tag.

RFID chips are already used by several European countries to help officials to prevent forgeries and to speed up the processing of international visitors. By October 2006, the U.S. government will require nearly all of the passports it issues to include a computer chip containing the passport holder's name, nationality, gender, date of birth, and place of birth as well as a digitized photograph of that person.

The State Department has included several security measures in the proposed passport standard. Reading a passport's RFID chip requires a password generated by scanning the machine readable data on the inside front cover. Additionally, a small shield in the front cover is supposed to only allow wireless passport reading when the booklet is open.

According to Flexilis, a better solution utilizes a dual cover shield and a specifically designed RFID tag assembly which is able to shield the passport until it is significantly open, not just a fraction of an inch. Thus, even when the passport is slightly open in the pocket, purse, or briefcase, the user are protected from malicious data-theft, and RFID-equipped terrorists.

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