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Now everybody knows: Master keys easy to forge

The Associated Press
1/23/03 5:54 PM

FLORHAM PARK, N.J. (AP) -- Locksmiths have known for years that anybody with a key to a building whose locks have a master key can create their own master key.

But now that such findings by an AT&T researcher are getting wide attention, the company has warned law enforcement agencies nationwide about the technique, which could be used to defeat locks in most office and apartment buildings, as well as schools and dormitories.

"Creating such a key requires no special skill, leaves behind no evidence, and does not require engaging in recognizably suspicious behavior. The only materials required are a metal file and a small number of blank keys, which are often easy to obtain," said the researcher, Matt Blaze, of AT&T Labs-Research.

Security experts said that the method, which has become readily available on the Internet, should prompt building managers to consider switching to "control key" systems, where the blanks are not sold to the public, or adding alarms or video surveillance.

Another option is using "master ring" lock systems or locks that use multiple cylinders, Blaze said. Organizations can also assess whether they really need a master key system, or if it can be more limited, such as having a different master key for each floor instead of one for the whole building, he said.

His findings were reported Thursday in The New York Times.

Blaze is not a locksmith; he is a cryptographer, usually working on codes to protect computers and other systems, and finding weaknesses that hackers exploit to break into networks.

Last year, Blaze examined whether codes can protect other things, and turned first to mechanical locks. After months of reading about locks, he began testing his theories and found the vulnerability, he said in an interview Thursday.

"This technique has been discovered and rediscovered over the years by locksmiths, and probably criminals," said Blaze, 40, who lives in New York City and Menlo Park, Calif. However, "I may be the first to work out all the details."

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Among them: It usually takes less than 50 "probes" of a lock to gain enough information about the master key, and four to seven blank keys, depending on the number of pins in the lock cylinder, to create a copy.

The vulnerability stems from the design of basic master key systems. The pins, which are pushed to different levels by the teeth of the key, have two positions that allow the lock to open -- one for its individual key, the other from the master key.

"Interestingly enough, techniques like this don't appear in the written literature," Blaze joked.

"The criminals have no desire to warn us," he said, and once word of his research began to spread, Blaze decided more people needed to know.

"Since this research was completed last fall, we have been quietly circulating details of the vulnerability to the lock, law enforcement, and security communities. However, there is some evidence that the details are now circulating in the underground world. At this point we believe that it is no longer possible to keep the vulnerability secret and that more good than harm would now be done by warning the wider community," he wrote in a summary of his findings.

Blaze's findings will probably have a modest impact on the lock industry, said Lloyd Seliber, senior training manager for Schlage Lock Co., in Security, Colo.

"There's been an ongoing trend toward key control. He's moved the ball forward a little bit," Seliber said. Currently, just under 20 percent of Schlage lock sales are key control, he said.

He estimated that about 20,000 people a year learn of the technique to defeat master key locks in locksmith training provided by lock companies, the military and law enforcement.

He said master key systems are useful in large buildings where maintenance staff and emergency personnel, such as firefighters, need easy access.

"They can't be fooling around with a ring of keys," Seliber said.

However, even buildings with master key systems have some locks that will not open with a master key, such as those protecting hospital pharmacies, he noted.

Marc Weber Tobias, a former prosecutor and author of, "Locks, Safes, and Security," agreed that few people would change their locks after learning of the vulnerability.

"Some will, but the majority won't, because they'll say they haven't had any problems to date," said Tobias, who has an investigative law practice in Sioux Falls, S.D.

"Security professionals really ought to pay attention to this," he said.

Tobias said he tested the simplicity of Blaze's technique by providing a local 15-year-old boy with the instructions, a file and blank keys. The teen crafted a master key in 15 minutes.

On the Net:

Blaze summary: <http://www.crypto.com/masterkey.html>

Blaze paper: <http://www.crypto.com/papers/mk.pdf>.

Associated Locksmiths of America: <http://www.aloa.org>

American Society for Industrial Security:

<http://www.asisonline.org>

Institute of Electrical and Electronics Engineers:

<http://www.ieee.org>

Tobias' Investigative Law Offices: <http://www.security.org>

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