USB Flash Drive Enhanced through RFID Authentication

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The proposed system has a two-folded purpose: first, from the computer side, to protect the file system from potential malware coming out of unauthorized flash drives, and second, from the flash drive side; to protect stored data from being accessed by unauthorized users logged in regular computers. This concept seeks to add one more cost-effective layer of protection against threats to data either in the computer or the flash-drive.

The enhancement consists of attaching an RFID reader to the main USB hub of the computer and an RFID tag to the USB flash drive (figure 1.) Upon detection that an USB device has been plugged in, the RFID reader will try to get the ID of the flash drive. Whether there is no response or the ID is invalid, the flash drive will be denied any access to the computer. In a more advanced version, the protection scheme will include a computational RFID tag to shut down the enhanced flash drive whenever plugged into an unauthorized computer.

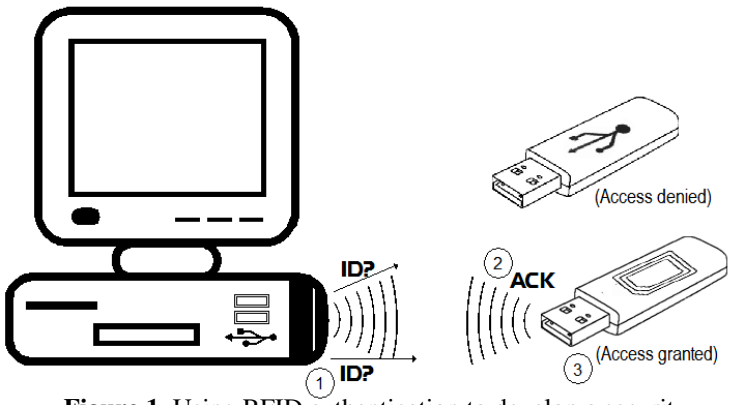

Figure 1. Using RFID authentication to develop a security enhanced computer/flash drive system.

As proof-of-concept, a testing platform comprised by the Atmel's AT90USBkey board [8] and the Touchatag's RFID system (ACS 122U reader and MiFare tags) [3] is being developed. The AT90USBkey can be used as a flash drive [4, 5] and its capability to enable user authentication, along with data encryption, has been demonstrated recently [7].

Previous attempts to integrate RFID technology to everyday computers have been done by Sony (2006), incorporating an RFID reader into the Japanese VAIO computers to simplify online transactions [6], and by Pretec (2007), using RFID technology as a secondary way to access data in the flash drive [2]. In a related but independent work, the company Freecom has recently developed the Mobile Drive Secure [1]. This is an external hard drive with an RFID reader integrated, which grants or denies access to disk after verification of users' RFID keycard. Our approach differs from Freecom's one because, given the small size of the flash drives, the mass storage device only contains the RFID authentication tag, while the actual computer contains the reader.

References:

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