

Embedded Systems Security

Muhammad Farooq-i-Azam
COMSATS Institute of Information Technology, Lahore, Pakistan

Muhammad Naeem Ayyaz
University of Engineering and Technology, Lahore, Pakistan

ABSTRACT

Not long ago, it was thought that only software applications and general purpose digital systems i.e. computers were prone to various types of attacks against their security. The underlying hardware, hardware implementations of these software applications, embedded systems and hardware devices were considered to be secure and out of reach of these attacks. However, during previous few years, it has been demonstrated that novel attacks against the hardware and embedded systems can also be mounted. Not only viruses, worms and Trojan horses have been developed for them but they have also been demonstrated to be effective. Whereas a lot of research has already been done in the area of security of general purpose computers and software applications, hardware and embedded systems security is a relatively new and emerging area of research. This chapter provides details of various types of existing attacks against hardware devices and embedded systems, analyzes existing design methodologies for their vulnerability to new types of attacks, and along the way describes solutions and countermeasures against them for the design and development of secure systems.