

ABSTRACT

IMPLEMENTATION OF WRITING STUDENTS' DATA TO SMART CARDS FOR SMART CAMPUS APPLICATION

Smart cards is a product that can used as a multi-application. These applications include ID cards, security systems, and payment systems. In order to work, then the smart card must programmed in such a way. Smart cards programming requires a protocol to communicate with other devices, the protocol can identified through a smart cards output message called Answer to Reset (ATR). APDU (Application Protocol Data Unit) is a set of protocols that allow for the exchange of data packets between smart cards with other devices. In order for the communication can be operated by human, then required Graphical User Interface (GUI).

In this final project, embedded system implementation will be performed to program 4KB Mifare smart cards, 64KB SCard32 smart cards, smart card reader and GUI design on single board computer (SBC) as the interface used for smart cards writing application as students' data. The tests performed were ATR testing of several smart cards, GUI response, execution time, and APDU response (R-APDU). Student data including name, students' ID number, university, and photo will used as test scenario.

From the results of tests performed, ATR obtained from Mifare 4KB is 3B_h 81_h 80_h 01_h 80_h 80_h, and SCard32 64KB is 3B_h 90_h 96_h 81_h 11_h FE_h 68_h. ATR tests through GUI is done by trying to communicate with other smart card vendors. UID line display on GUI will not appear if ATR smart card does not match ATR Mifare 4KB and SCard32 64KB. For an average execution time based on data of 45 bytes = 0.939 ms, 502 bytes = 1,901 ms, 2481 bytes = 16,625 ms, 10042 bytes = 52,834 ms, and 15608 bytes = 69,387 ms. For R-APDU test of Mifare 4KB smart card when instructions, format, create file, and write commands it gets 91_h 00_h indicating successful operation and when get uid, and create directory commands it gets 91_h AF_h indicates that the data frame has been sent. For R-APDU of SCard32 64KB when format, create file, and write commands it gets 95_h 00_h indicating successful operation and when get uid, and create directory commands it gets 95_h AF_h that indicates data frame already sent.

Keywords: *smart card, answer to reset, Application Protocol Data Unit, smart card reader, single board computer, graphical user interface*