Mittuniversitetet
MID SWEDEN UNIVERSITY

Final exam

DT145G Computer Security

Daniel Bosk

Department of Information Systems and Technology,
Mid Sweden University, SE-851 70 Sundsvall
Email: daniel.bosk@miun.se
Phone: 010-142 8709

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Instructions

Carefully read the questions before you start answering them. Note the time limit of the exam and plan your answers accordingly. Only answer the question, do not write about subjects remotely related to the question.

Write your answers on separate sheets, not on the exam paper. Only write on one side of the sheets. Start each question on a new sheet. Do not forget to *motivate your answers.*

Make sure you write your answers clearly, if I cannot read an answer the answer will be awarded no points—even if the answer is correct. The questions are *not* sorted by difficulty.

Time 5 hours.

Aids Dictionary.

Questions 5

Preliminary grades

Each question can be awarded up to three points: one point for E, two points for C and three points for A. To get an E, you must get at least one point on each question — i.e. no question must be awarded zero points. For a C, you must get two points on at least half of the questions. For an A, you must get three points on at least half of the questions.

Questions

The questions are given below. They are not given in any particular order.

(3p) 1. Game consoles is a good example of a class of devices where part of the security is to lock the user out from the highest privileges. The classic example is the Sony PlayStation where users at first could choose to run Linux instead, but Sony later changed their mind and disallowed that. However, users found ways around that, namely buffer overruns (*e.g.*, stack overflows).

   Explain, on a conceptual level, how one could exploit a buffer overrun (*e.g.*, stack overflow) in the PlayStation operating system to install and run Linux instead.

(3p) 2. Alice and Bob wants to communicate securely, *i.e.*, through an end-to-end encrypted and authenticated channel (*e.g.*, Signal, Telegram, WhatsApp, PGP/Protonmail). What do they have to do to make this happen?

(3p) 3. You are asked to analyse two password policies. The policies are the following:

   basic12 Let *the user choose* at least 12 characters consisting of: upper and lower case, numbers.

   randswedict4 *Generate a password for the user* by randomly choosing four words from the Dictionary of the Swedish Language (SAOL). This dictionary contains approximately 125 000 words.

   Analyse the two policies: what are the advantages and disadvantages of each, how do they compare to each other.

(3p) 4. What is attribute-based access control (ABAC) and what are its advantages?

(3p) 5. Explain the idea of double-entry book-keeping.