Distributed Trust Management: Assignment 1

Questions

1. Search in the news an article about privacy violations. Describe briefly the reported incident and discuss its privacy implications (at most one page). The reference (or url) to the article should be given. **Note:** The article should be at most six month old.

2. Assume a protection system with the following commands:

   command modify_own_right (s, o, r)
     if own in $A[s, o]$
     then *enter r into $A[s, o]$*
   end

   command grant_right (s_1, s_2, o, r)
     if own in $A[s_1, o]$ and
       $r \neq$ write
     then *enter r into $A[s_2, o]$*
   end

   command transfer_right (s_1, s_2, o, r)
     if read in $A[s_1, o]$ and
       r in $A[s_1, o]$ and
       own not in $A[s_1, o]$
     then *enter r into $A[s_2, o]$*
         delete r into $A[s_1, o]$
   end

   Suppose Bob has created a report; he wants the report to be read by other users but not modified by them. Is the system secure? Justify the answer.

3. Let TOP SECRET, SECRET, and UNCLASSIFIED be the security levels (ordered from highest to lowest), and Army, Navy and Diplomacy be three categories. We have four subjects:

   - the president has TOP SECRET clearance for Navy, Army and Diplomacy,
   - the ambassador has TOP SECRET clearance for Diplomacy,
   - the colonel has SECRET clearance for Army and Navy, and
   - the soldier has UNCLASSIFIED clearance for Army.

   We also have some objects (documents):

   - the army position at security level TOP SECRET,
   - the navy position at security level TOP SECRET,
   - the position of allies at security level TOP SECRET,
   - the number of army units at security level SECRET,
   - the number of navy units at security level SECRET,
   - the costs of the army at security level UNCLASSIFIED, and
   - the costs of the navy at security level UNCLASSIFIED.

   Answer the following questions based on the Bell-LaPadula model:

   (a) Draw the lattice of classifications.

(b) Can the president compute the total number of army and navy units?

(c) Can the ambassador compute the overall defense position (army + navy + allies)?

(d) Can the colonel compute the army and navy position?

(e) Can the president change the overall defense position (army + navy + allies)

(f) Can the colonel change the army and navy position?

(g) Can the soldier change the army and navy position?

Justify the answer.

4. Define a construction to emulate the Chinese Wall model using BLP model. Discuss the limitations (if any) of the construction.

5. Define a $RBAC_3$ system to regulate a hospital information system. The system should implement (at least) the following requirements:

(a) Administration staff can add, modify, and view patients' demographic information.

(b) Medical staff (i.e., doctors and nurses) can view patients' demographic information.

(c) Doctors can add, modify, and view patients' medical information.

(d) Nurses can view patients' medical information.

(e) Routine surgeries should be approved by a doctor.

(f) Risky surgeries should be approved by two doctors.

(g) Surgeries should be performed by two doctors and a nurse.

6. Describe the access control system used in SELinux.

Deadline: 3 December 2012
How to submit the assigment: – by email (n.zannone at tue dot nl)
For any question send me an email