Outline for January 13, 2012

Reading: §3.1, 3.2

1. What is the safety question?
   a. An unauthorized state is one in which a generic right $r$ could be leaked into an entry in the ACM that did not previously contain $r$. An initial state is safe for $r$ if it cannot lead to a state in which $r$ could be leaked.
   b. Question: in a given arbitrary protection system, is safety decidable?

2. Mono-operational case: there is an algorithm that decides whether a given mono-operational system and initial state is safe for a given generic right.

3. General case: It is undecidable whether a given state of a given protection system is safe for a given generic right.
   a. Approach: represent Turing machine tape as access control matrix, transitions as commands
   b. Reduce halting problem to it

4. Take-Grant
   a. Counterpoint to HRU result
   b. Symmetry of take and grant rights
   c. Islands (maximal subject-only $tg$-connected subgraphs)
   d. Bridges (as a combination of terminal and initial spans)

5. Sharing
   a. Definition: can share($\alpha, x, y, G_0$) true iff there exists a sequence of protection graphs $G_0, ..., G_n$ such that $G_0 \vdash^* G_n$ using only take, grant, create, remove rules and in $G_n$, there is an edge from $x$ to $y$ labeled $\alpha$