Outline for December 8, 2006

Reading: §15.2, 15.4

1. Greetings and felicitations!
   a. Puzzle of the day
   b. Volunteer for course evaluations

2. Capabilities
   a. Capability-based addressing
   b. Inheritance of C-Lists
   c. Revocation: use of a global descriptor table

3. Privilege in Languages
   a. Nesting program units
   b. Temporary upgrading of privileges

4. MULTICS ring mechanism
   a. MULTICS rings: used for both data and procedures; rights are REWA
   b. \((b_1, b_2)\) access bracket—can access freely; \((b_3, b_4)\) call bracket—can call segment through gate; so if \(a\)'s access bracket is \((32,35)\) and its call bracket is \((36,39)\), then assuming permission mode (REWA) allows access, a procedure in:
      - rings 0–31: can access \(a\), but ring-crossing fault occurs
      - rings 32–35: can access \(a\), no ring-crossing fault
      - rings 36–39: can access \(a\), provided a valid gate is used as an entry point
      - rings 40–63: cannot access \(a\)
   c. If the procedure is accessing a data segment \(d\), no call bracket allowed; given the above, assuming permission mode (REWA) allows access, a procedure in:
      - rings 0–32: can access \(d\)
      - rings 33–35: can access \(d\), but cannot write to it (W or A)
      - rings 36–63: cannot access \(d\)