Lecture 24: May 21, 2021

Reading: *text*, §16.4, 23.3.1   **Assignments:** Homework 4, due May 24
                                                                          Lab 3, due May 26

1. MULTICS ring mechanism

    (a) Rings, gates, ring-crossing faults

    (b) Used for both data and procedures; rights are REWA
        (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

2. Malware, malicious logic

3. Trojan horse

    (a) Rootkits

    (b) Propagating Trojan horses

4. Computer virus

    (a) Infection vectors: boot sector, executable