March 7, 2023 Outline

Reading: text, §18.2–18.3.2

Assignments: Homework #4, due March 14

1. Isolation: virtual machines
2. Isolation: non-virtual containers
   (a) Library operating systems
   (b) Sandboxes
3. Isolation: program modification
   (a) Software fault isolation
   (b) Compiling
   (c) Loading
4. Covert channels
   (a) Storage vs. timing
   (b) Noise vs. noiseless
   (c) Existence
   (d) Bandwidth
5. Covert channel detection
   (a) Shared Resource Matrix Model
   (b) Information flow analysis
   (c) Covert flow trees
6. Shared resource matrix methodology
   (a) Identify shared resources, attributes
   (b) Operations accessing those attributes
   (c) Building the matrix
   (d) Issues about the methodology
7. Information flow analysis
   (a) Direct, indirect flows
8. Covert flow trees
   (a) Goals, symbols
   (b) Construction of covert flow trees
   (c) Analysis
   (d) Example
9. Capacity
   (a) When is bandwidth of covert channel?
   (b) Analysis
   (c) Measuring capacity