

Phd Qualifying Exam: Operating Systems

November 27, 2006

- 1a. Define "early binding" and "late binding". Explain the relative advantage each possesses over the other.
 - 1b. Give one example of each. (Hint: think of how operating systems did memory management in the past and currently.)
-
2. Tanenbaum states that the three principles of operating system API design are simplicity, completeness, and efficiency. Discuss the principle of completeness. What does this term mean? What is the relationship between completeness and minimum of mechanism?
-
- 3a. What is a "trusted computing base"?
 - 3b. What is the trusted computing base of a typical UNIX computer?
-
4. Tanenbaum lists 6 principles for the design of secure systems:
 - The design of the system should be public
 - The default should be "no access"
 - Check for current authority
 - Give each process the least privilege possible
 - Protection mechanisms should be simple, uniform, and built into the lowest levels of the system
 - The scheme chosen should be psychologically acceptable
-
- 4a. Discuss any three: for each principle you choose, explain how systems based on this principle are more likely to be secure than if the principle was not followed.
 - 4b. Give an example of an operating system NOT checking for current authority.