

ECS 235B Module 21

Tranquility

Principle of Tranquility

- Raising object's security level
 - Information once available to some subjects is no longer available
 - Usually assume information has already been accessed, so this does nothing
- Lowering object's security level
 - The *declassification problem*
 - Essentially, a “write down” violating *-property
 - Solution: define set of trusted subjects that *sanitize* or remove sensitive information before security level lowered

Types of Tranquility

- Strong Tranquility
 - The clearances of subjects, and the classifications of objects, do not change during the lifetime of the system
- Weak Tranquility
 - The clearances of subjects, and the classifications of objects, do not change in a way that violates the simple security condition or the *-property during the lifetime of the system

Example: Trusted Solaris

- Security administrator can provide specific authorization for a user to change the MAC label of a file
 - “downgrade file label” authorization
 - “upgrade file label” authorization
- User requires additional authorization if not the owner of the file
 - “act as file owner” authorization

Principles of Declassification

- Principle of Semantic Consistency
 - As long as semantics of components that do not do declassification do not change, the components can be altered without affecting security
- Principle of Occlusion
 - A declassification operation cannot conceal an *improper* declassification
- Principle of Conservativity
 - Absent any declassification, the system is secure
- Principle of Monotonicity of Release
 - When declassification is performed in an authorized manner by authorized subjects, the system remains secure