Protection(1974)

**Mainpoints: use small set of abstractions to unify discussion of protection concepts and mechanisms.**

Protection mechanism: control the access of a program to other things in a system.

E.g. different modes, memory relocation, file numbers, password scheme

## why there is protection

To protect one user’s error from hurting other users.

Unpredictability of users in a system.

two aspects of protection models: generality && complexities

## protection domains

Protection environments and contexts;

E.g. kernel mode && user-mode; multi-user systems

\*domain\*

Message system: different processes which share no data are communicated by a message containing an identification number and data.

The flaws:

1. strongly rely on the system to control all the processes and their communications(就像需要一个在交流方面严格中心化的系统？);
2. Those runaway processes can waste resources.

## objects and access metrics

object system: a set of objects X, a set of domains D, an access matrix or access function A.

Objects: those things in the system which have to be protected, such as processes, domains, files, segments, terminals

Domains: entities which have access rights to objects.

Access matrix: control the access rights of domains to objects

In this matrix, there is a machinism called copy flag.

## some implementation techniques

The implement methods for access matrix

1. provide C-lists: capability list for domain
2. Attach the protection information to objects

Access key: a capability used for identification

## memory protection

1. memory which is not in the range of the map cannot be named;
2. Paged of segmented system has protection information in each page or segment;

Each domain has to get its own address space;