



OPERATING SYSTEMS COURSE

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Topic 6 Presentation Guide: Introduction to Security in OS

Computer systems handle information that is often valuable for their owners, so the safety of such systems is an important design element of operating systems. In this topic the main concepts of security and protection mechanisms that can be used to provide such security through the operating system are studied. Although traditionally the safety and protection terms have been used interchangeably, now both concepts are clearly distinguished .

The security of a system has many facets, ranging from issues such as protection against physical damage of data (fires, earthquakes, etc.) to improper access to them (intrusion, privacy failures, etc.). Attacks on privacy, integrity or availability of resources in a system must be prevented and solved through political and security mechanisms of a system. In the case of a computer system, there are several elements likely to suffer such attacks, not sufficient to protect any of them or only partially protected. Software and data may suffer a computer system internal or external to system attacks. Therefore, security must take into account external events from the environment in which the system operates.

The protection, however, is to prevent misuse of resources made when it is within the scope of the operating system. They must be mechanisms and policies to ensure that users have access only to their own resources (files, memory areas , etc.) . In addition , you need to check that resources are used only by those users who have access rights to them. Protection policies and security hardware , software and data to be included within the operating system and can affect one or more components. In any case, the operating system must provide means to implement the policy of protection desired by the user, as well as means of enforcing that policy.

The security of an operating system is mainly based on three aspects of design: avoid loss of data, control data privacy, and control access to data and resources. Therefore, all operating systems include internal mechanisms and external services to ensure those responsibilities. Protection services and security of a system vary depending on the complexity of the implemented system. This topic some protection services classic generic operating systems are shown, without going into protection mechanisms in distributed systems or key distribution problems for networks.

The topic includes one lesson:

- Introduction to Security in OS.

The primary objective of the subject is to show the concepts of security and protection that are handled in operating systems to prevent unauthorized access to the system and the operating system itself.

This general objective is broken down into a series of specific objectives, which are listed below:

- To show the concepts of security and protection.
- To provide security issues and security policies to address them.
- To introduce the concept of cryptography and encryption mechanisms.
- To show protection mechanisms in operating systems and security classifications to which they fit.
- To study the main user authentication methods .
- To understand protection services and security provided by the operating system .

Associated Materials

The theoretical lessons are complemented with exercises for each of them, to be resolved after the classes, as specified in the schedule associated with the teaching guide.

Mandatory and recommended reading with more problems and solved exercises are included, so that students can complete their training.