SimpleSmartLoader Report

This report presents an overview of the SimpleSmartLoader program. The program is designed to handle segmentation faults as page faults, and dynamically map memory segments upon fault handling. The design follows specific rules for page-by-page allocation, reporting, and ELF loading behavior. The program was created by Ansh Varma and Aaman Sheikh, both of whom contributed equally to the project.

Introduction

The SimpleSmartLoader program is designed to simulate a memory loader that handles segmentation faults and dynamically maps memory pages based on predefined rules. The loader interacts with memory segments, pages, and ELF (Executable and Linkable Format) files. The design emphasizes fault detection and handling, including reporting of memory allocation and page-by-page loading.

Key Features

- Segmentation fault handling as page faults

- Dynamic memory mapping

- Page-by-page memory allocation

- Fault reporting

- ELF file loading and handling

- Comprehensive page fault handler mechanism

Design Overview

The design of SimpleSmartLoader is based on handling memory faults as page faults. The memory is divided into segments and pages, and any segmentation fault triggers the loading of a new page,

allocating memory dynamically as required. The program maintains a fault handler that processes these faults and ensures the proper mapping of memory segments. ELF file loading is integrated to simulate loading executable programs into memory.

Conclusion

The SimpleSmartLoader program provides a realistic simulation of memory handling techniques, including dynamic memory mapping, segmentation fault management, and ELF file loading. By dynamically allocating memory and processing page faults, it demonstrates key concepts in memory management and fault tolerance in computing systems.

Contributors

This project was developed by Ansh Varma and Aaman Sheikh, both of whom contributed equally to the design and implementation of the program. Their combined effort brought together a comprehensive approach to handling memory faults and simulating ELF loading in a controlled environment.