Vicențiu-Alecsandru Duță

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Education

Polytechnic University of Bucharest **Oct 2022 – June 2026**
Faculty of Automatic Control and Computer Science, BS in Computer Science *Bucharest, Romania*

Projects

IMDB Application view repo
- Developed an application which simulates a platform similar to IMDb, enabling users to browse and manage a database of movies, actors, and directors.
- The project showcases OOP principles like inheritance, polymorphism, and encapsulation.
- Tools Used: Java

Router view repo
- Implemented a software-based router capable of forwarding IP packets, handling ARP requests, and generating ICMP error messages.
- The project demonstrates key networking concepts such as routing algorithms, ARP table management, and packet-level communication.
- Tools Used: C

Memory Allocator view repo
- Built a custom memory allocator capable of managing dynamic memory allocation, deallocation, and resizing of memory blocks.
- The program provides a comprehensive interface for memory management, mimicking standard library functions while handling both small and large memory requests efficiently.
- Tools Used: C

Dynamic UDP/TCP Messaging Server view repo
- Created a UDP and TCP server capable of managing multiple client connections and facilitating communication through message broadcasting.
- Implemented a subscription model that allows clients to subscribe and unsubscribe from specific topics, enabling targeted message delivery.
- Utilized socket programming to handle both UDP and TCP protocols, ensuring efficient and reliable message transmission.
- Tools Used: C++

Parallel Inverted Index Calculator view repo
- Developed a parallel program using the Map-Reduce paradigm to create an inverted index for a collection of text files, enabling efficient word-to-document mapping.
- Implemented dynamic load balancing for Mapper threads to process files efficiently, and coordinated Reducer threads for result aggregation and alphabetical organization.
- Used Pthreads for parallel processing and implemented thread synchronization mechanisms to ensure data consistency.
- Tools Used: C++

Switch view repo
- Implemented a software-based switch that implements Ethernet-level routing functionality, handling packet forwarding through MAC address detection, traffic filtering, and unicast/multicast identification.
- The project demonstrates key networking concepts such as MAC address filtering, Ethernet header parsing, VLAN tagging, and Spanning Tree Protocol (STP) for loop prevention.
- Tools Used: Python

Technical Skills

Languages: C, C++, Assembly, Python, Java, Javascript, HTML/CSS, Racket, Haskell
Concepts: Data Structures, OOP, Algorithms, Networking and Protocols, Multithreading, MPI