FACULDADE DE ENGENHARIA DA UNIVERSIDADE DO PORTO

Configuration and Study of a Computer Network and Development of a File Transfer Protocol Client

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Licenciatura em Engenharia Informática e Computação

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Resumo

Este relatório descreve o estudo, configuração e análise de uma rede de computadores, bem como o desenvolvimento de um cliente File Transfer Protocol (FTP). A configuração da rede foi realizada através de scripts automatizados, abrangendo a atribuição de endereços Internet Protocol (IP), configuração de routing, Domain Name System (DNS) e ligação de múltiplos dispositivos (máquinas, switch e router). O cliente FTP, desenvolvido em C, implementa autenticação de utilizador, modo passivo, transferências binárias e download de ficheiros, seguindo as normas RFC959 e RFC1738. O projeto demonstra competências práticas tanto na configuração de redes como na implementação de protocolos de aplicação.

Abstract

This report describes the study, configuration, and analysis of a computer network, as well as the development of an File Transfer Protocol (FTP) client. The network setup was automated through scripts, covering Internet Protocol (IP) address assignment, routing configuration, Domain Name System (DNS), and the interconnection of multiple devices (machines, switch, and router). The FTP client, developed in C, implements user authentication, passive mode, binary transfers, and file downloads, following RFC959 and RFC1738 standards. The project demonstrates practical skills in both network configuration and application-layer protocol implementation.

Contents

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List of Acronyms

FTP   File Transfer Protocol

IP   Internet Protocol

DNS   Domain Name System

Chapter 1

Introduction

Briefly introduce the project objectives: network configuration and FTP client development.

Chapter 2

Part 1 – Download Application

2.1   Architecture of the Download Application

Describe the FTP client architecture, main modules, and protocol features.

2.2   Successful Download Report

Describe a successful file download, including a Wireshark screenshot of FTP packets

Chapter 3

Part 2 – Network Configuration and Analysis

3.1 Experiment 1

3.1.1 Network Architecture

Describe the network setup for this experiment.

3.1.2 Objectives

State the learning objectives.

3.1.3 Main Configuration Commands

List the main commands/scripts used.

3.1.4 Relevant Logs

Show relevant logs and outputs.

3.1.5 Analysis

Discuss the results and learning points.

3.2 Experiment 2

...existing code...

3.3 Experiment 3

...existing code...

3.4   Experiment 4

...existing code...

3.5   Experiment 5

...existing code...

3.6   Experiment 6

...existing code...

Chapter 4

Conclusions

Summarize findings, challenges, and skills acquired.

Chapter 5

References

Chapter 6

Annexes

6.1 Download Application Code

Include the source code

6.2 Configuration Commands

List scripts and manual commands used.

6.3 Captured Logs

Attach relevant logs from experiments and application runs.