

TCP/IP: Mobility



A widely popular feature of today's data communication networks is the ability of users to connect to the network anytime in any place over any medium. However, the core Internet protocols were designed before user mobility and wireless communication links were in widespread use. This course focuses on the challenges that mobility and wireless communication bring to the Internet protocol suite. The course briefly reviews the relevant portions of the IP and TCP protocols, introduces the problems caused by mobility and wireless links, and presents a range of solutions. These span from Internet standards to various commercial and academic solutions, exhibiting a number of design trade-offs in terms of performance or security, for example.

Duration: One day

Target audience

Individuals that need to support mobile users in TCP/IP networks.

Prerequisites

Our “Networking Foundations: Fundamentals Level I” and “Networking Foundations: Fundamentals Level II” are highly recommended or an understanding of networks and data communications. The course assumes familiarity with TCP/IP, such as taught in “TCP/IP: Fundamentals”

You will learn how to

- Understand and identify the challenges TCP/IP faces in a mobile world
- Evaluate standard and proposed enhancements to TCP/IP to deal with these challenges
- Select appropriate solutions to support a mobile workforce at the networking level



Topics

Introduction to TCP/IP

- History of Communication
- History of IP
- Benefits of IP
- Internet Architecture
- IAB
- Request for Comments (RFC)
- IETF
- Internet, Intranet, Extranet
- Internetworking Layer

IPv4 Overview

- IP Relationships between layers
- IPv4 Header Format and Options
- Overview of IP Addressing
- Architecture
- IP Address Classes
- Transport Protocols

TCP/UDP Overview

- Services of TCP/UDP
- Applications of TCP/UDP
- TCP/UDP Details
- TCP/UDP Flow
- How TCP/UDP operate in switched and routed networks
- Detail examples of TCP
- Detail examples of UDP

Mobility

- Types of Mobility
- Review of Mobility Solutions
- Mobility below the IP Layer: WiFi, Cellular Networks, etc.
- DHCP
- Mobile IP
- Micro-Mobility Protocols

IP Mobility

- Solution Constraints
- Basic Framework
- Introduction to Terminology
- Route Optimization
- Fast and Smooth Handoffs
- Security Concerns
- Changes in IPv6

TCP and Mobility

- Introduction to Congestion Control
- TCP Congestion Control
- Reasons for Packet Loss in a TCP/IP network
- Enhancing TCP: Data Link Layer Solutions
- Enhancing TCP: Transport Layer Solutions
- Snoop