

Assignment 4

Title: IPv6 Section Update

Description:

Students are required to update and improve the IPv6 section in the Network book. The update should include clear explanations, proper structure, and relevant technical details related to the next-generation Internet Protocol. The content should bridge the gap between theoretical concepts and practical network implementation.

Requirements:

To ensure the book section is comprehensive, the update must cover the following key topics:

- **Introduction & Motivation:** Explain the primary reasons for transitioning from IPv4 to IPv6 (specifically addressing IPv4 address exhaustion).
- **Address Architecture:** Detail the IPv6 address structure (128-bit), hexadecimal notation, and the different types of addresses (Unicast, Multicast, Anycast).
- **Packet Structure:** Describe the simplified IPv6 header format and compare it with the IPv4 header.
- **Transition Mechanisms:** Discuss methods used to transition from IPv4 to IPv6, such as Dual Stack, Tunneling, and Translation (NAT64).
- **ICMPv6:** Briefly explain the role of ICMPv6 in neighbor discovery and error reporting.
- **Security & QoS:** Discuss built-in security features (IPSec) and Quality of Service improvements.

Recent Developments:

Students are encouraged to include modern applications of IPv6, such as:

- IPv6 deployment in 5G networks.
- The role of IPv6 in the Internet of Things (IoT).
- IPv6 and Cloud Computing integration.

Formatting Guidelines:

- Use clear technical language appropriate for networking students.
- Include diagrams or illustrations where necessary (e.g., packet headers).
- Proper formatting and organization (headings, subheadings, and bullet points) are required.

Submission:

The completed assignment must be sent to the following email address:

alaidi@uowasit.edu.iq

Email Requirements:

To ensure your assignment is processed correctly, students must adhere to the following submission guidelines:

Email Subject Line: Assignment 4 – IPv6 – [Student Full Name]

(Example: Assignment 4 – IPv6 – Ali Ahmed)

Email Body: The text of the email must include the following details:

Student Full Name:

Department / Year:

Attachment Format:

The assignment must be submitted as a PDF file to preserve formatting.

File Naming: The file must be named using the format:

StudentName_Assignment1_IPv6.pdf

(Example: Name_Assignment1_IPv6.pdf)

Deadline:

20-3-2026