Assignment:5

WRC078BEI040

What is the value for each of the header fields of an ip4 packets

? Describe each fields. Explain why the value is what it is.

* The IPv4 header is a 20-byte structure that contains several fields, each serving a specific purpose in the transmission of packets. Below is a detailed description of each field, its typical values, and the reasoning behind these values.

1. Version (4 bits):

Value: 4

Description: Indicates the IP version being used. For IPv4 packets, this value is always 4.

1. Internet Header Length (IHL) (4 bits):

Value: Typically, 5 (which means 5 \* 4 bytes = 20 bytes)

Description: Specifies the length of the IP header in 32-bit words. A value of 5 indicates no options are present, making the header 20 bytes long.

1. Type of Service (TOS) (8 bits):

Value: Depends on the priority and type of service requested (commonly 0)

Description: Indicates the quality of service desired, such as delay, throughput, reliability, and cost. Typically set to 0 for normal service.

1. Total Length (16 bits):

Value: Varies based on the size of the entire IP packet (header + data)

Description: Specifies the total length of the IP packet in bytes. This value varies depending on the size of the data being transmitted.

1. Identification (16 bits):

Value: Varies (e.g., a unique number for each packet sent by the same host)

Description: Identifies fragments of an original IP packet. It helps in reassembling fragmented packets.

1. Flags (3 bits):

Value: Typically, 010 (don't fragment flag set)

Description: Consists of three flags: Reserved (always 0), Don't Fragment (DF), and More Fragments (MF). The DF flag can be set to 1 to prevent fragmentation.

1. Fragment Offset (13 bits):

Value: 0 if the packet is not fragmented

Description: Indicates the position of the fragment in the original packet. If the packet is not fragmented, this value is 0.

1. Time to Live (TTL) (8 bits):

Value: Commonly 64 or 128

Description: Limits the packet's lifespan by specifying the maximum number of hops it can take before being discarded. Each router decrements this value by 1.

1. Protocol (8 bits):

Value: Varies (e.g., 6 for TCP, 17 for UDP)

Description: Identifies the protocol used in the data portion of the IP packet. Common values are 6 for TCP, 17 for UDP, and 1 for ICMP.

1. Header Checksum (16 bits):

Value: Computed for each packet

Description: Used for error-checking the IP header. Calculated by the sender and verified by the receiver.

1. Source IP Address (32 bits):

Value: Varies (e.g., 192.168.1.1)

Description: Specifies the IP address of the sender.

1. Destination IP Address (32 bits):

Value: Varies (e.g., 192.168.1.2)

Description: Specifies the IP address of the receiver.

1. Options (Variable):

Value: Optional (e.g., 0 if not used)

Description: Used for network testing, debugging, security, etc. This field is optional and not commonly used in standard IP packets.