This Diagram demonstrates an Ethernet II Frame. The Datalink, WWW.FIREWALL.CX ETHERNET II FRAME IP and TCP/UDP headers are analysed here, to give a better understanding on how they all fit within a Ethernet II frame. Preamble & **Datalink** IP TCP OR UDP **FCS** This is the frame you would have on your local network running **DATA** SOF/Synch Header TCP/IP. The lengths in the diagram are in **Bits**, unless specified. Header Header Note that 8 Bits = 1 Byte.LAYER 1 LAYER 2 LAYER 3 LAYER 4 LAYER 5,6,7 LAYER 2 **64 to 1518 bytes long** \mathbf{C} D **32** 32 32 32 16 16 6 16 16 16 R A 48 16 4 32 16 16 32 32 16 Т \mathbf{C} 16 16 16 16 From 46 to 1500 bytes long **Header of packet** IP PACKET TCP PACKET **UDP PACKET Preamble:** 7 bytes of 10101010. **4 VERS**: IP version **16 Source Port:** Specifies the port on **16 Source Port:** An optional 16bit field that providing a 5Mhz clock at the start of specifies the port on the sending module when a reply is anticipated. If not, then value is 0. the sending TCP module. each packet, this allows the receiver **32 HLEN**: length of this layers packet to lock the incoming bit stream. **8 Type of Service**: How the datagram 16 Destination Port: Specifies the 16 Destination Port: 16bit field that should be handled port on the receiving TCP module. **Start Of Frame**: Marks the start specifies the port on the receiving UDP module. of a new frame1 byte, thus: 10101011 32 Sequence Number: Ensure correct **16 Total Length**: Length including **16 Length:** 16 bit field specifies the length of The sync. Field is all 1's sequencing of data packets. Local header and data area the datagram in octets. 8-65535max **DATALINK** 16 Identification: Allows the datagram **32 Ack Number:** Next expected TCP octet **16 Checksum:** 16bit checksum to be fragmented and assembled providing error ctrl. 48 Destination MAC address 32 HLEN: length of this layers packet 2 Frag. flag: To control fragmentation 48 Source MAC address 6 Reserved 8 Fragment Offset: Contains correct **6 Code Bits:** Control functions. **FIN. 16 Ether Type:** 0800 = IPv4 position of fragment datagram, MTU affected SYN, RST, ACK, PSH, URG 0806=ARP, 8137-8138= Novell **8 TTL:** Time to live DATA from Layers 5, 6,7. 16 Windows Size: Number of octets This is the application data we need. e.g ftp **8 Protocol:** Indicates Upper layer prot. that the sender is willing to accept file, document file, picture e.c.t TCP=6 UDP=17 Type of Service **16 Checksum:** TCP header checksum. Bit 0 to 7 (8 bits) 16 Header Checksum: IP header (everything in the tcp packet) checksum.(everything in the ip packet) 16 Urgent Pointer: Indicates the end 32 Bit CRC Checksum 1 \recedence 32 Source IP address of the urgent data The last 4 bytes (32bits) that the adapter reads 3: Delay in are the Frame Check Sequence or CRC. 32 Destination IP address

4: Throughput

5: Reliability

6-7: Reserved

Var IP Option & padding: Security,

source routing-time stamp-network testing

32 Options: Max. TCP segment

This CRC is generated and put together by the

Datalink Laver