Network Administration HW1

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1 Reference

1. Internet Protocol Stack: 5-layer model

   (a) http://microchipdeveloper.com/tcpip:tcp-ip-five-layer-model

   (b) i. https://www.wikiwand.com/en/Hypertext_Transfer_Protocol

   ii. https://www.wikiwand.com/en/Transmission_Control_Protocol

   iii. https://www.wikiwand.com/en/Internet_Protocol#/Function

   iv. http://searchnetworking.techtarget.com/definition/Ethernet

   v. https://www.webopedia.com/TERM/1/10BaseT.html

2. IP

   (a) i. https://www.wikiwand.com/zh-tw/IPv4

   ii. https://www.wikiwand.com/zh-tw/IPv6

   (b) https://www.wikiwand.com/en/List_of_DNS_record_types

   (c) https://www.techbang.com/posts/10966-ipv6-ready-growth-of-128bits-die-company-mis-c
   page=3

3. Wireshark

   (a) https://www.wikiwand.com/en/HTTPS

   (b) https://osqa-ask.wireshark.org/questions/17718/how-to-filter-by-info-column

2 Problems

2.1 Internet Protocol Stack: 5-layer model

(a) They use "port address", "IP address", "MAC address" respectively to identify their packet source and destination.

(b) For **application layer**, "HTTP" is one of protocols that belong to it, which is used to exchange data or transfer hypertext.

"TCP" is the protocol of **transport layer**, which provides reliable, ordered and error-checked delivery of data between two application.

"IP" is the protocol of **network layer**, which is responsible for addressing host, encapsulating data into datagrams and routing datagrams across IP networks.

"Ethernet" is a protocol of **link layer**, which describe how network devices can format data for transmission to other network devices.

"100BASE-T" is a protocol in **physical layer**, which uses a twisted-pair cable to support 10 Mbps sending rate.

2.2 IP

(a) Theoretically, IPv4 can provide 2^{32} addresses and IPv6 can provide 2^{128} addresses.

(b) We need to add "AAAA" type record into the DNS server.

(c) Tunneling can encapsulate IPv6 packet into IPv4 packet in head end(which is C node) and strip the IPv4 header away in tunning end(which is D node), which will make the packet still be able to pass through C, D by using IPv4 address.

2.3 Wireshark

(a) I use **"dns"** to filter out packets.

My machine queries 192.168.0.1(which is default home broadband router).

(b) I use **"dns contains "headhunt""** to filter out packets. The dns query packet shows that the IP address of headhunt.com is 202.153.190.77

(c) I use **"ip.dst == 202.153.190.77"** and found out that it uses "TCP" and "HTTP" protocol.

(d) I use **"http contains "wireshark""** to filter out. See found result in Figure 1.
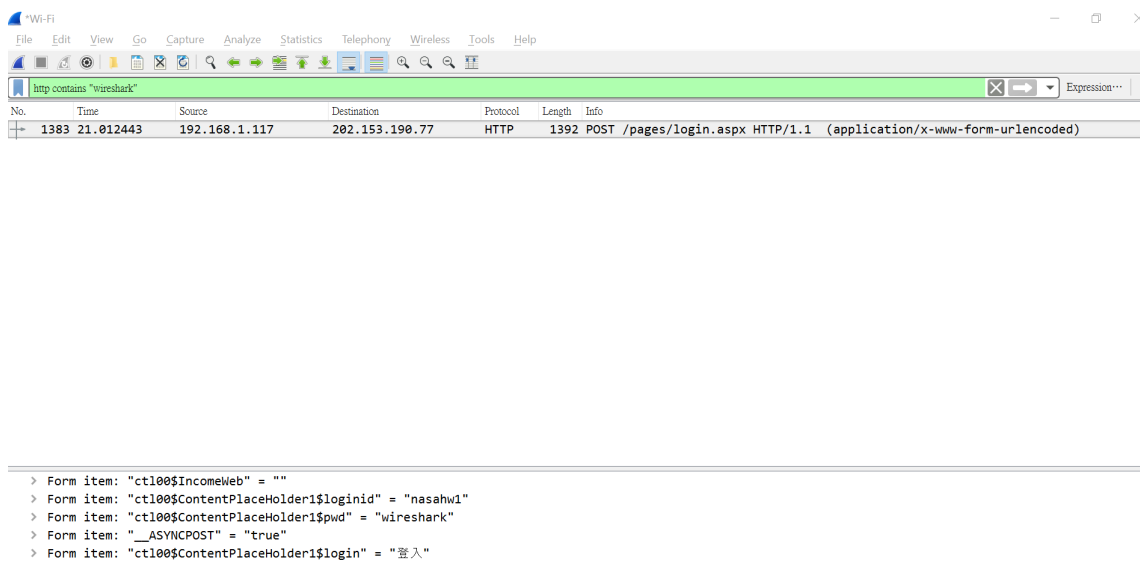
The packet uses HTTP protocol.

Figure 1: Packet contains id and password

(e) They should use HTTPS protocol.