Stories Related to Internet Security

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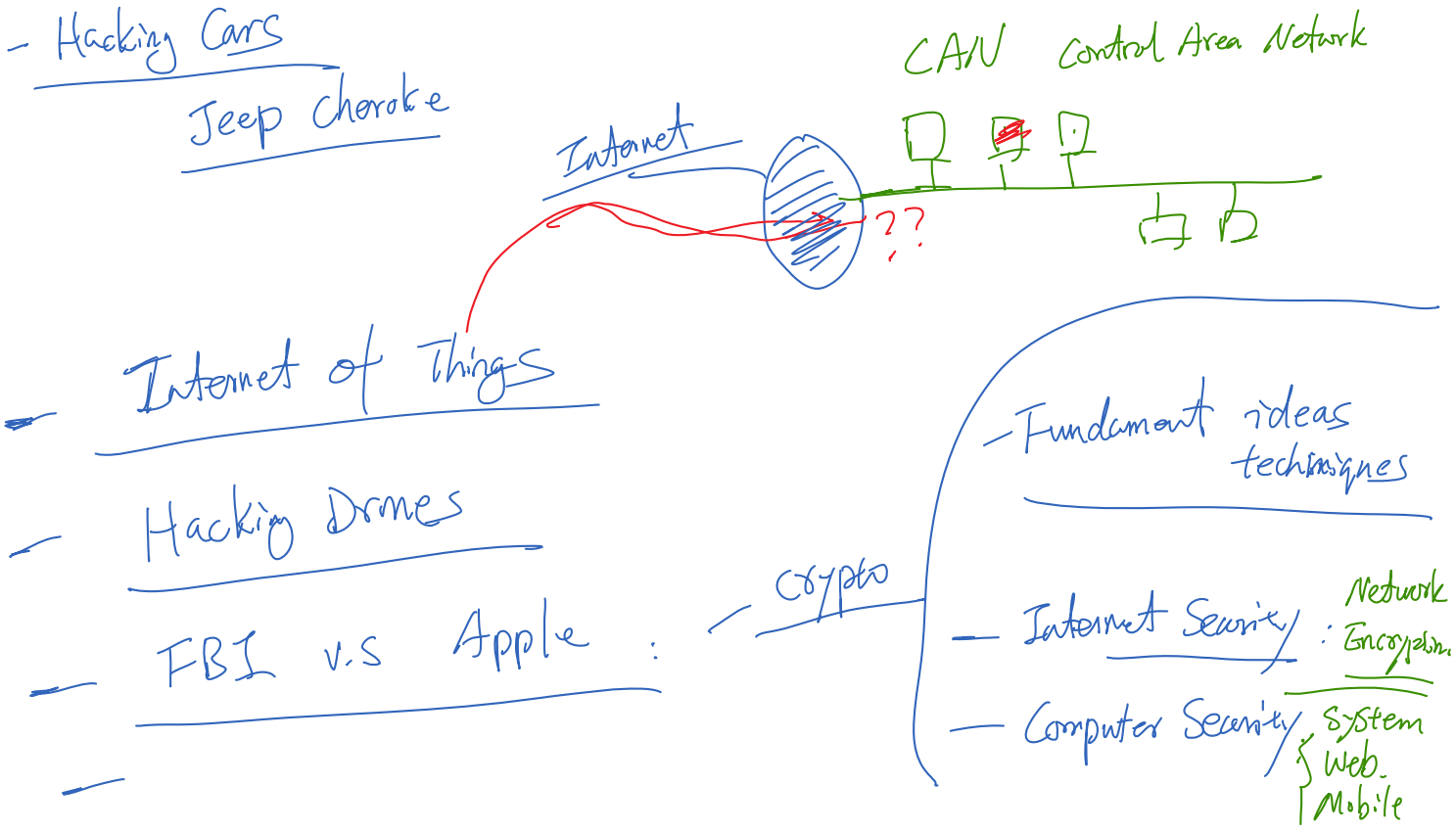
Stories Related to Internet Security



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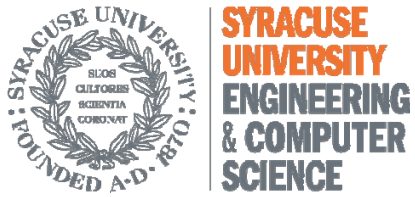
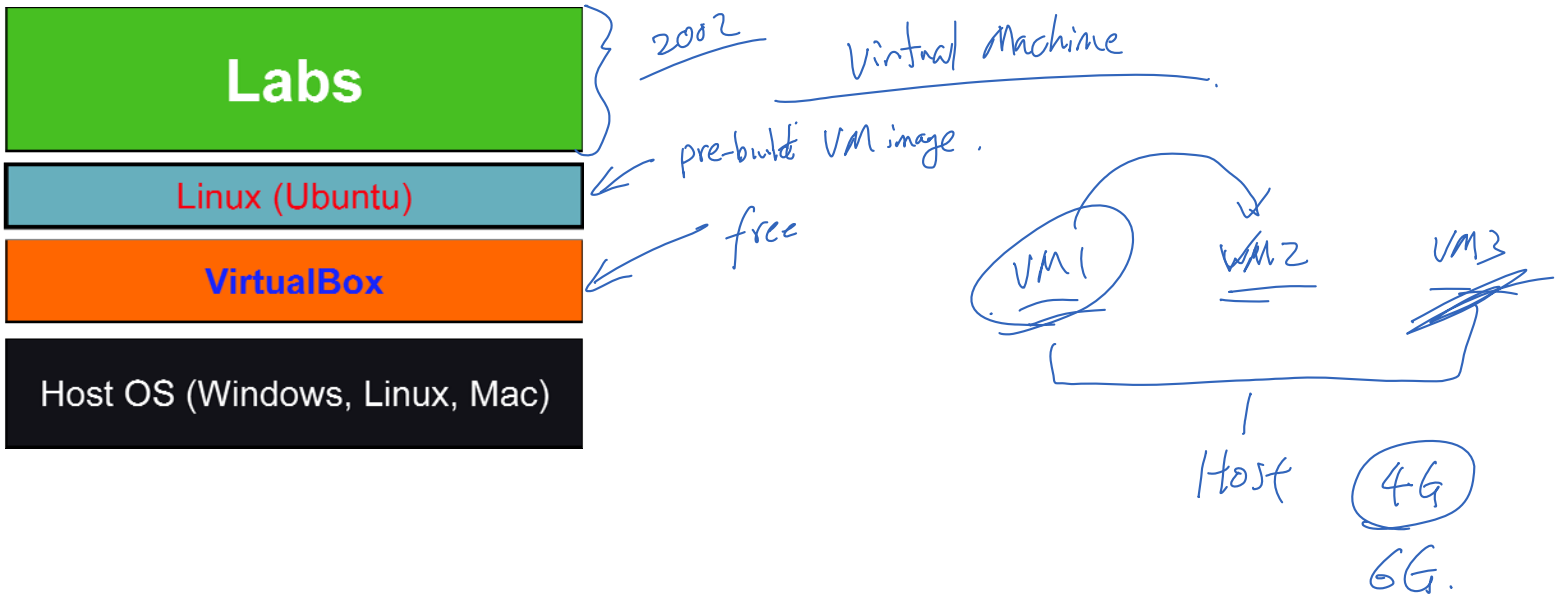
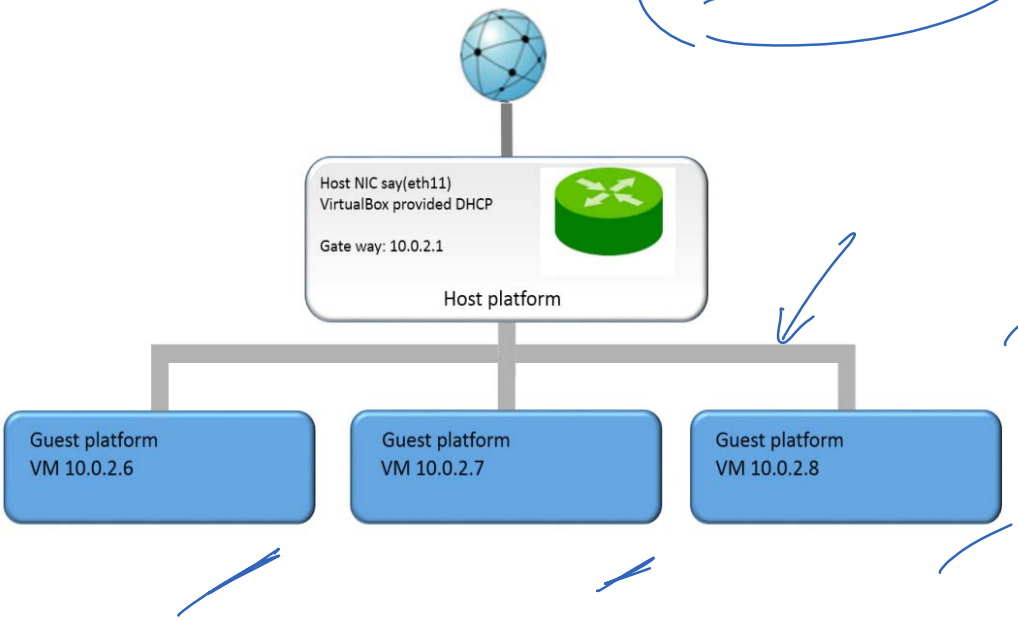
Hands-On Exercises



Hands-On Exercises: Lab Environment



Network Setup



Sample Lab Exercises

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Packet Flow Over the Internet

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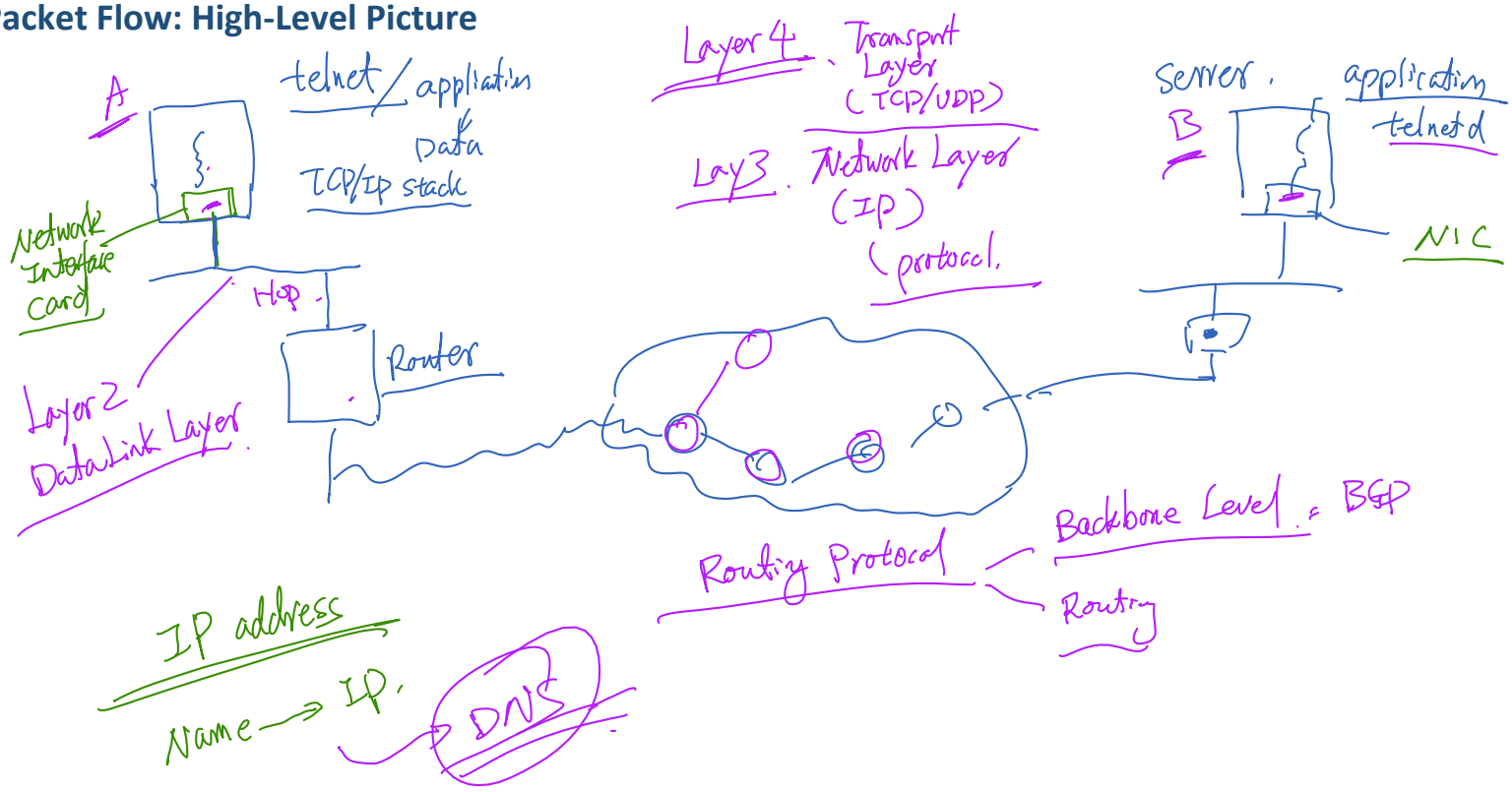
Packet Flow: High-Level Picture



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Attack Overview

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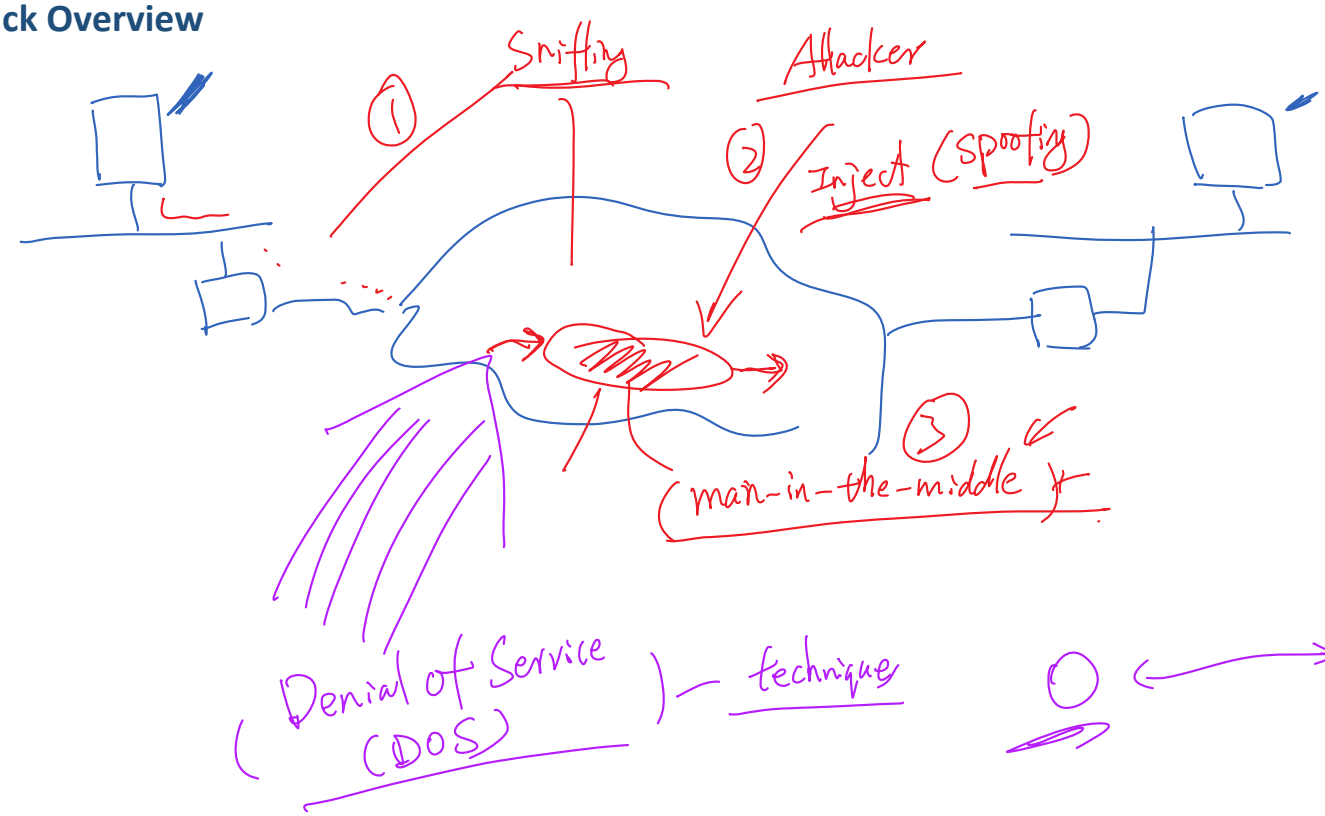
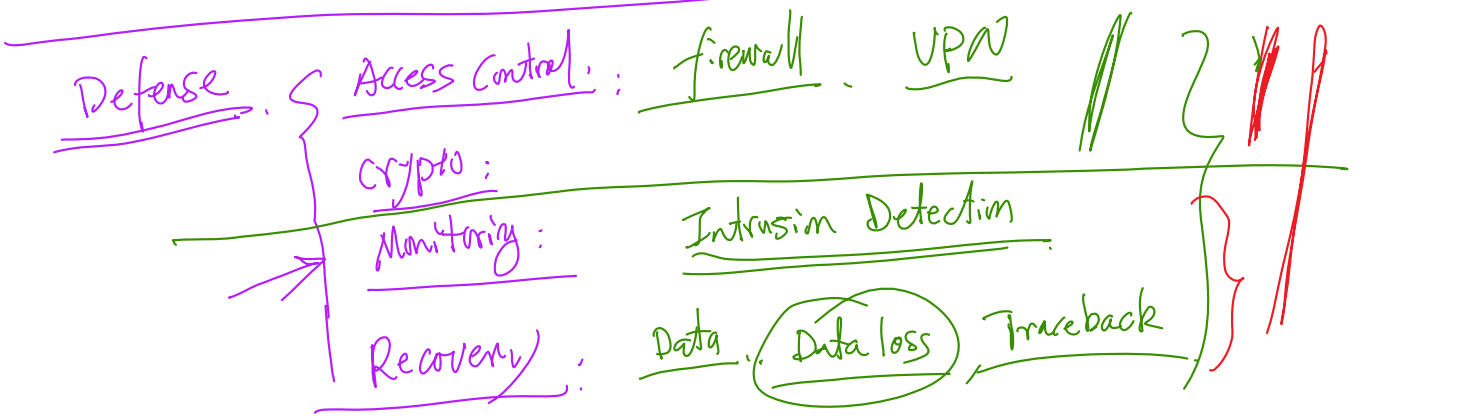
Attack Overview





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TCP/IP Layers

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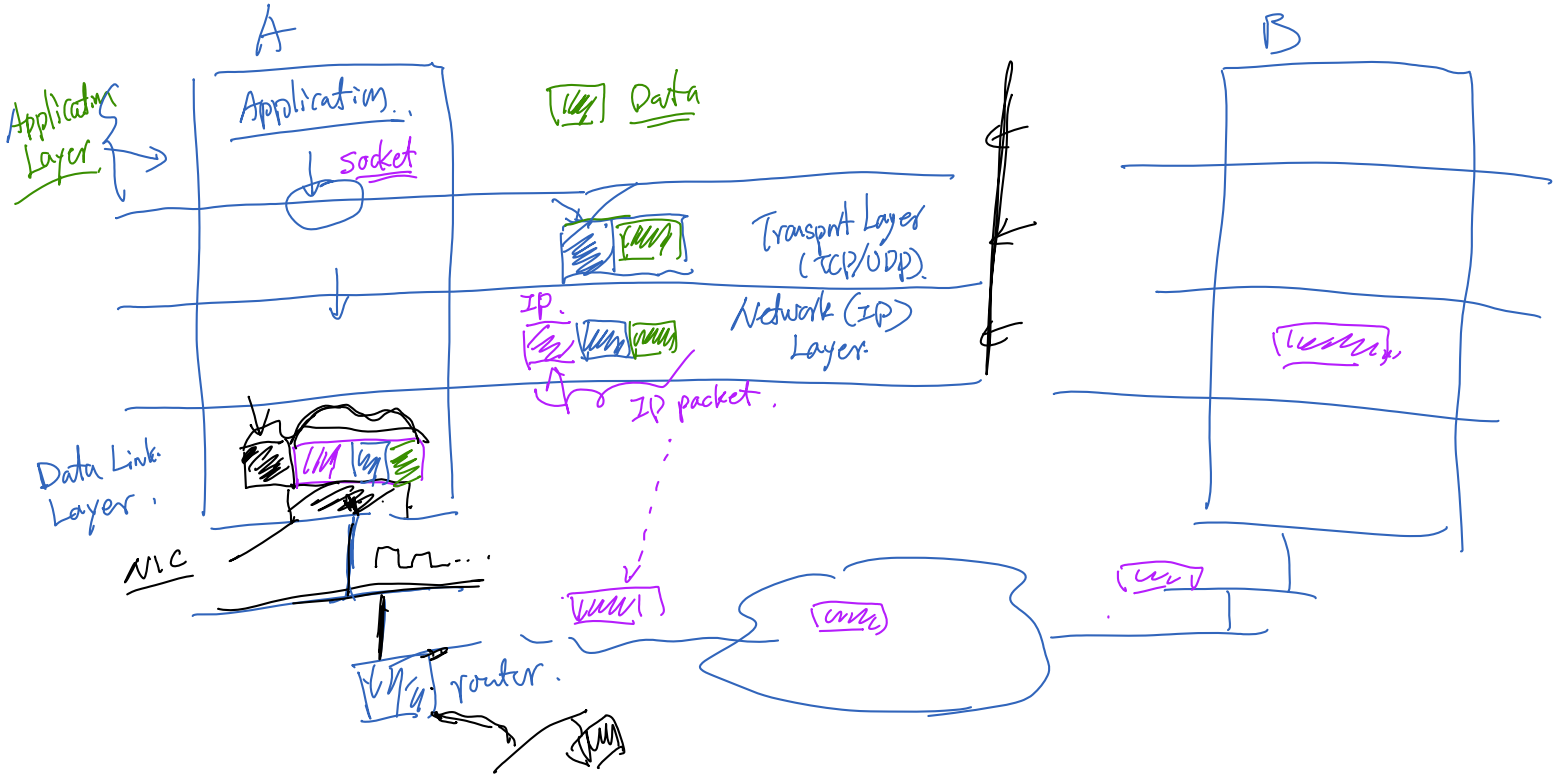
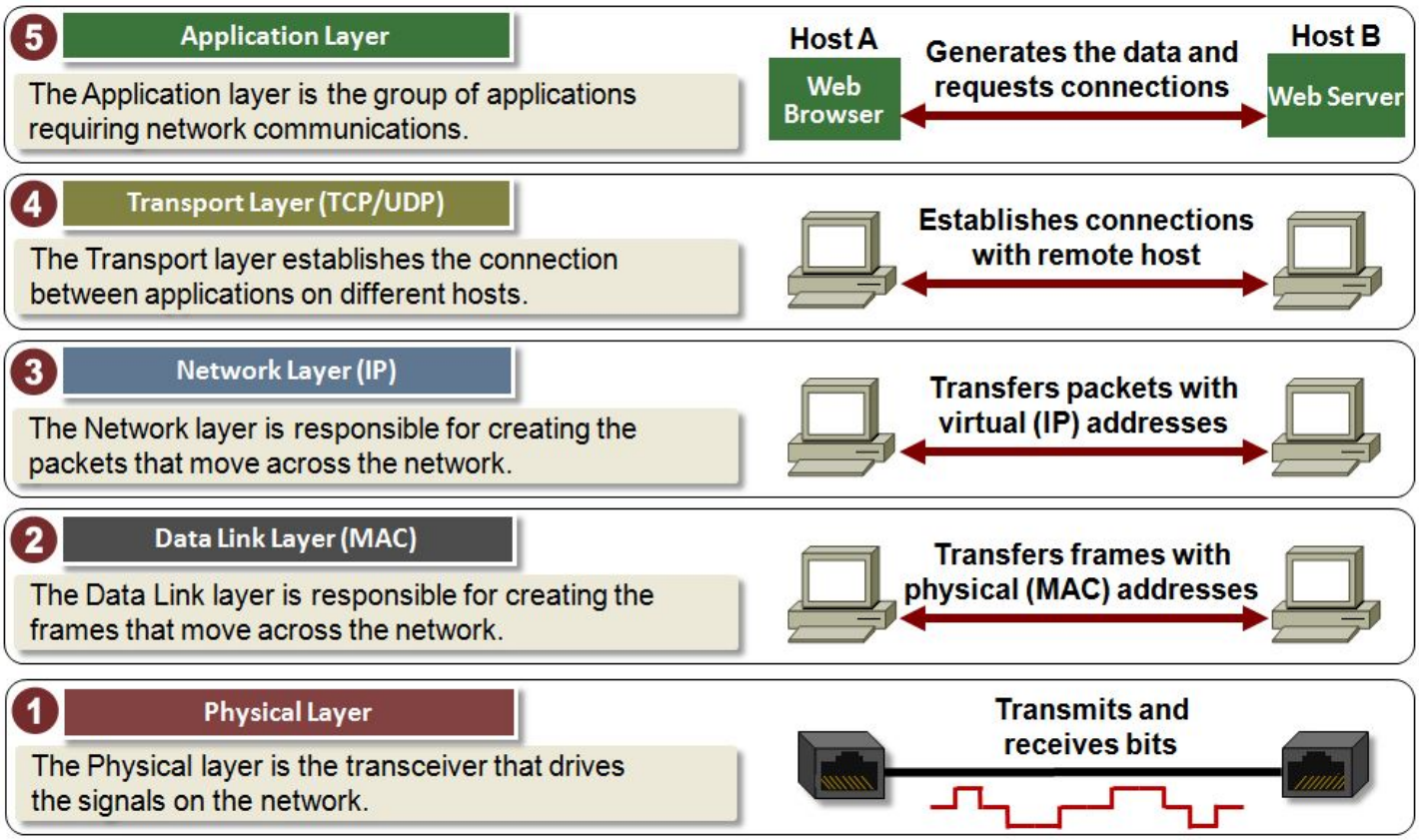
Network Data Traverses Through Layers



TCP/IP Layers



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IP Address

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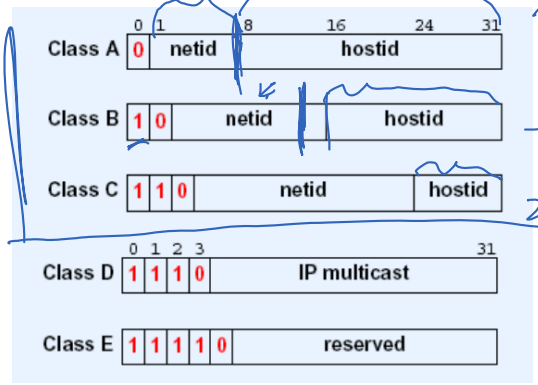
IP Address



2^{24}

Classful Scheme

2^{16}

128.230.. 2^{16}

2^{8}

32-bit IP.

2^{32}

Netmask

Classless Scheme.

netid

128.230.0.0/16

128.230.0.0/14

Netid

IP

2^{32}

IPV6

NAT

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Data Link Layer, Ethernet

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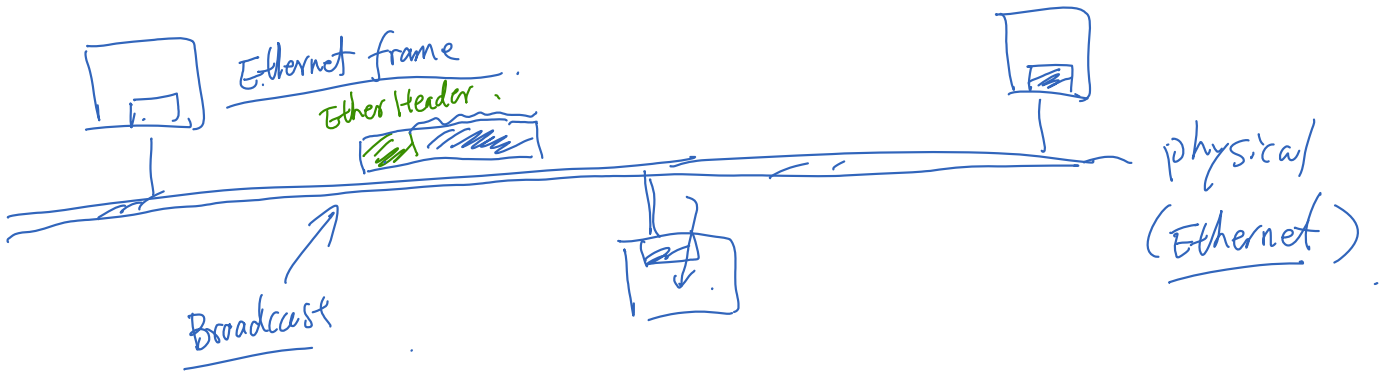
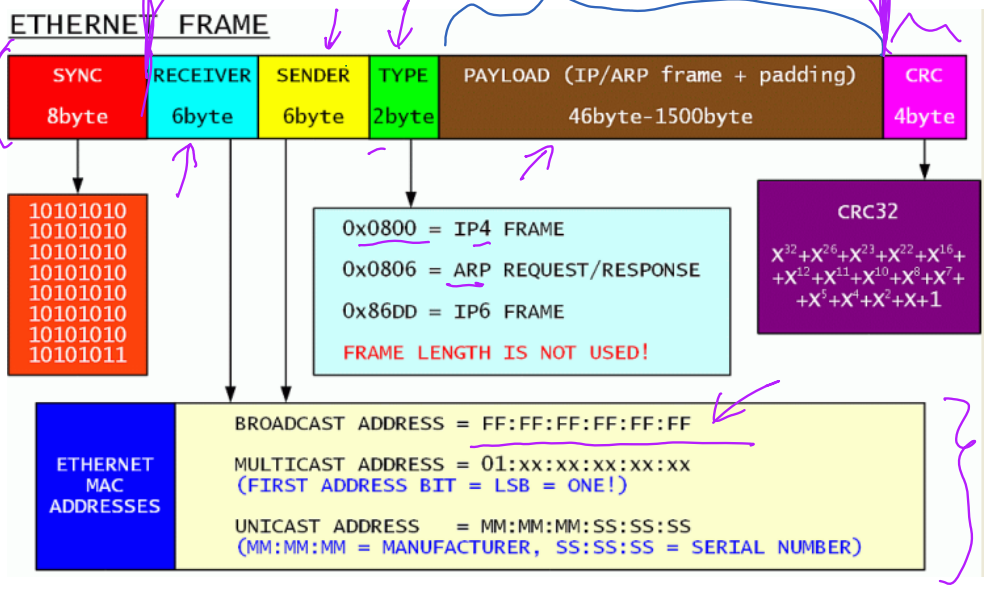
Data Link Layer (MAC Layer)



Ethernet Frame



Hardware Address
(MAC)
NIC

MAC Address Example

```
$ ifconfig
eth16     Link encap:Ethernet  HWaddr 08:00:27:cf:eb:bd
          inet addr:192.168.56.102  Bcast:192.168.56.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fecf:ebbd/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:35897 errors:0 dropped:0 overruns:0 frame:0
          TX packets:877 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:14323226 (14.3 MB)  TX bytes:159911 (159.9 KB)

eth18     Link encap:Ethernet  HWaddr 08:00:27:c5:79:5f
          inet6 addr: fe80::a00:27ff:fec5:795f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:32348 errors:0 dropped:0 overruns:0 frame:0
          TX packets:27211 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2839116 (2.8 MB)  TX bytes:1830313 (1.8 MB)
```

Privacy Issue Related to MAC

iOS 8 to stymie trackers and marketers with MAC address randomization

When searching for Wi-Fi networks, iOS8 devices can hide their true identities.

by **Lee Hutchinson** - Jun 9, 2014 10:56am EDT

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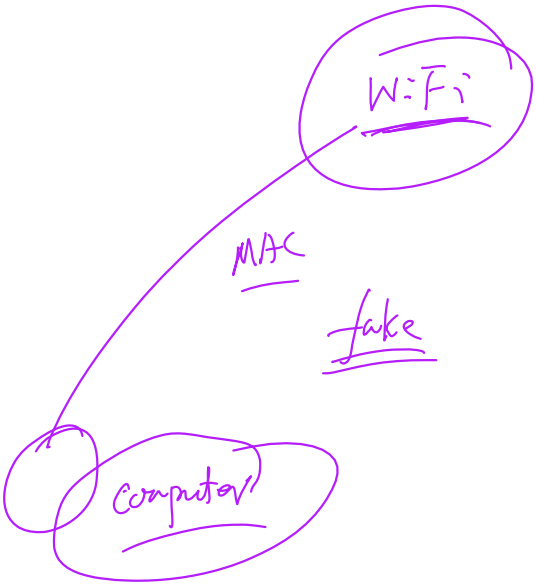
Quartz is reporting a change to how iOS 8-equipped devices search out Wi-Fi networks with which to connect. The new mobile operating system, which is on track for a release in the fall, gives iOS 8 devices the ability to identify themselves not with their unique burned-in hardware MAC address but rather with a random, software-supplied address instead.



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ARP Protocol

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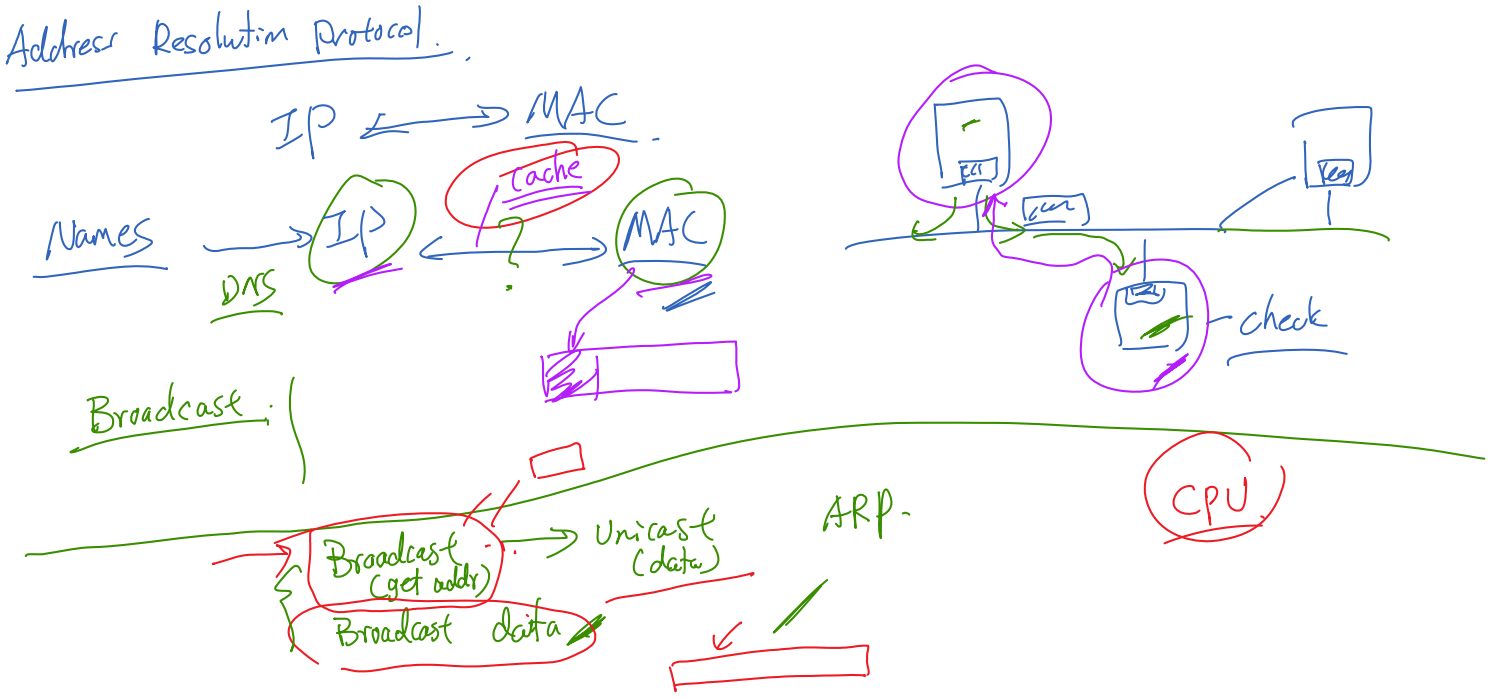
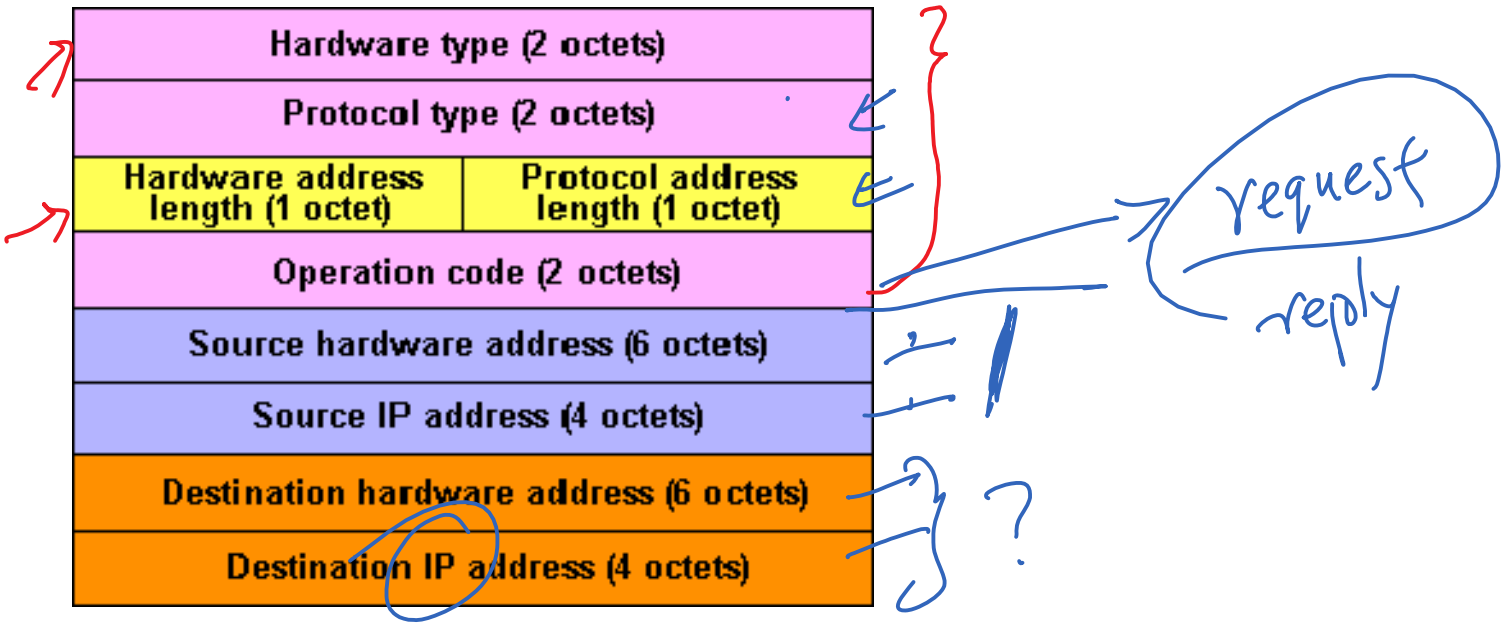
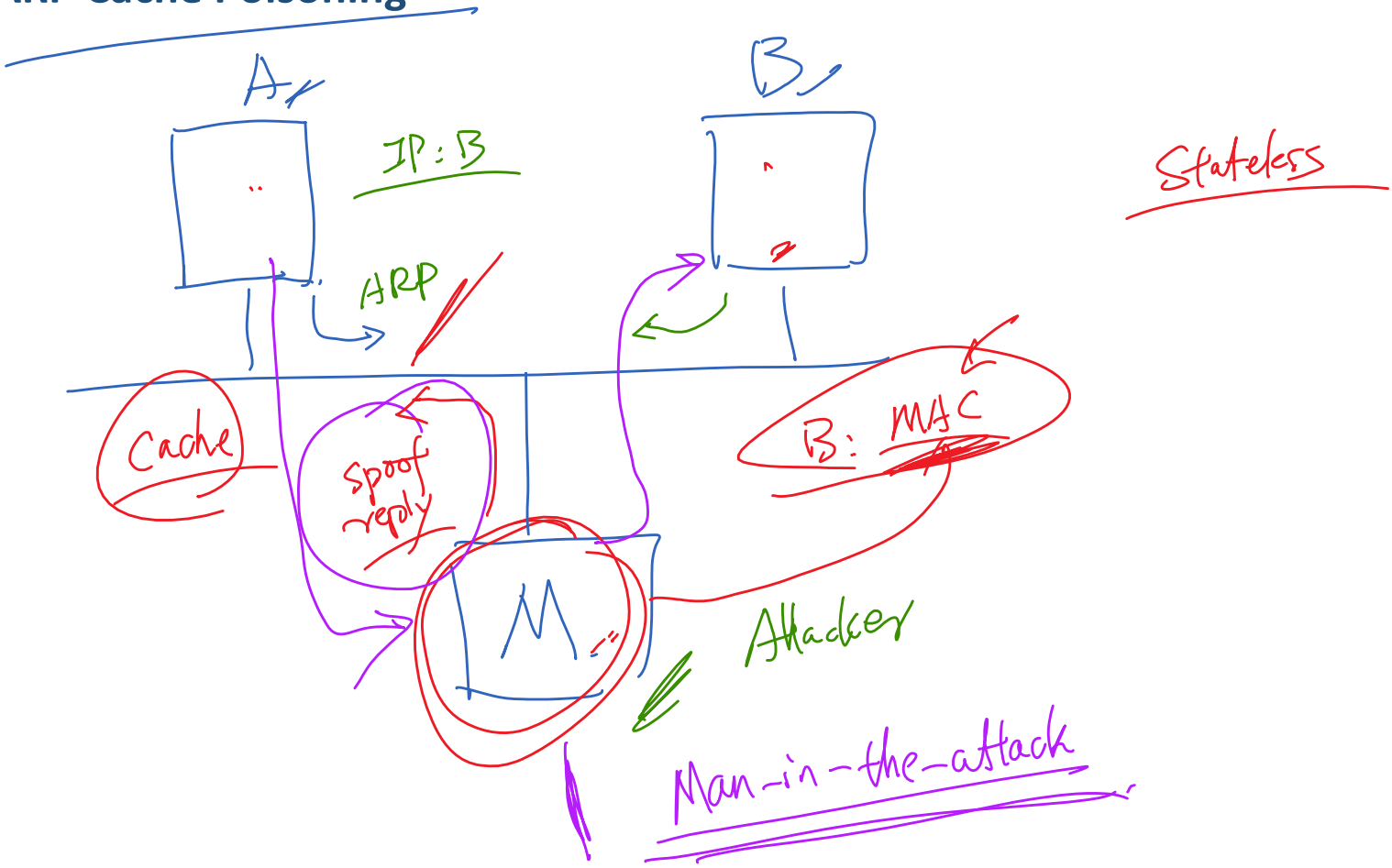
ARP: IP Address to Ethernet Address



ARP Format


Hardware type (2 octets)
Protocol type (2 octets)
Hardware address length (1 octet)
Protocol address length (1 octet)
Operation code (2 octets)
Source hardware address (6 octets)
Source IP address (4 octets)
Destination hardware address (6 octets)
Destination IP address (4 octets)
request
reply

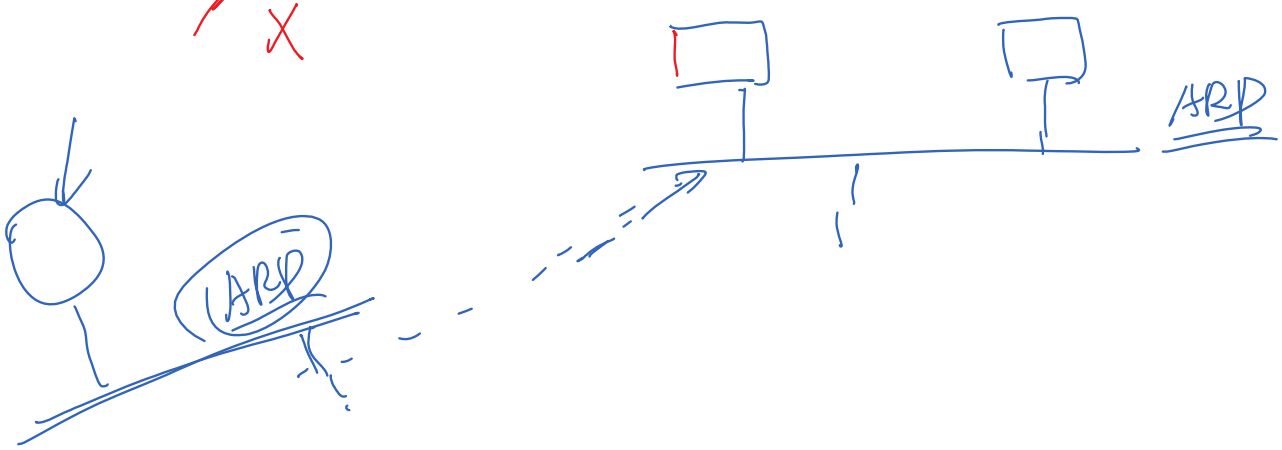
ARP Cache Poisoning



Question: ARP Cache Poisoning

Which of the following is true?

a. A computer in Russia can launch the ARP cache-poisoning attack on your computers in Syracuse.
b. The ARP cache-poisoning attack can achieve denial of service.
c. If the ARP does not use a cache, it is safe.



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Summary

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Summary

- High-level picture of packet flow and attack overview
- TCP/IP layers
- IP address
- Data link layer
- ARP protocol and ARP cache-poisoning attack

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