The Internet for Criminal Prosecutors

The Asia-Pacific Economic
Telecommunications Working Group
(APECTEL)

First Meeting of The Security and Prosperity Steering Group
Experts' Group on Cybercrime

Kuala Lumpur, Malaysia
September 24, 2011

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What you need to know

What evidence is available

Investigative techniques

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Topics we'll cover

Do you know all of this already?

- Networks
- ISPs
- Packet switching
- IP addresses
- IP tracebacks
- WHOIS
- Wireless Internet (Wi-Fi)
- NATs
- Proxies
- Client/server model
- Peer-to-peer file sharing
- Hacking
- Social engineering
- Botnets

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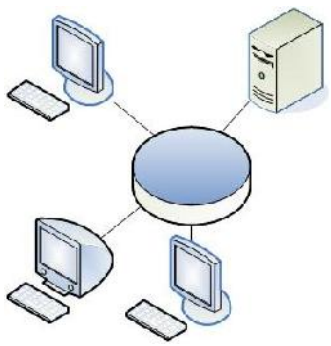
Network

Computers connected together



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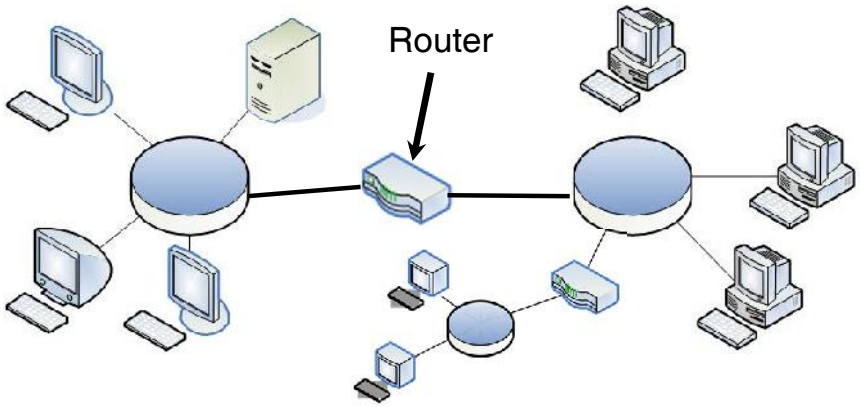
Internetwork

Networks connected together



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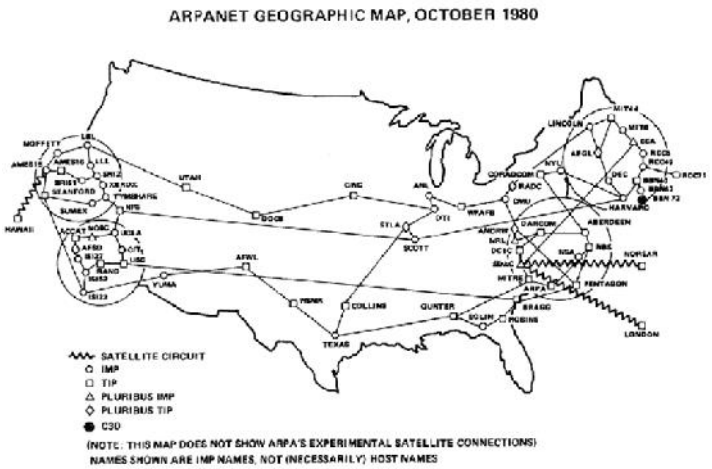
Internet

The biggest internetwork on the planet



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Server

A networked computer offering a service

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The client/server model

Why the Internet is useful

Send me
“www.tasteyoulove.com”

Client request

Server response

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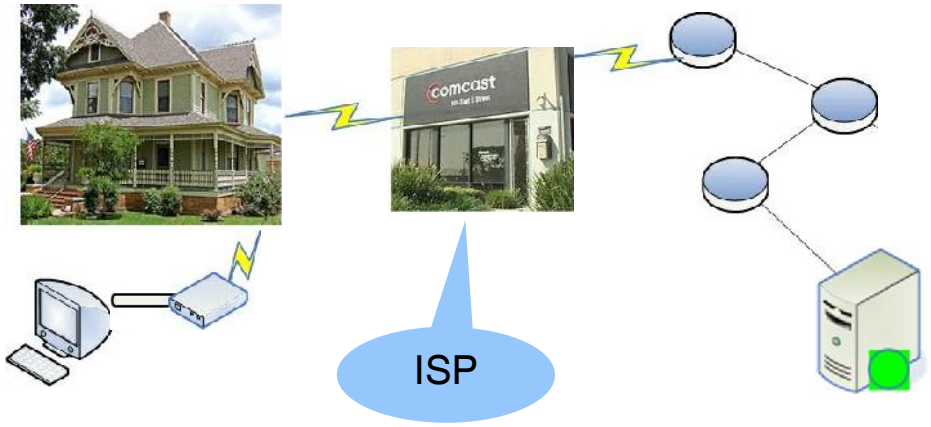
Internet Service Provider (ISP)

A company that connects you to the Internet



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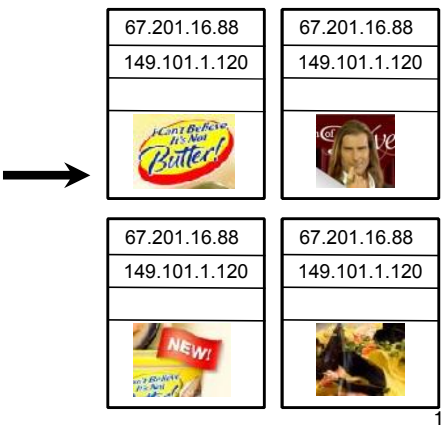
How computers send data

Everything is broken up into “packets”



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How computers send data

Computers send the packets

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Internet Protocol (IP) Addresses

Tell the Internet where to send packets

67.201.16.88
149.101.1.120
0111001010101011 1011011000100101 0100... 

Source ("from")

Destination ("to")

Part of data Being sent

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Internet Protocol (IP) Addresses

Everyone on the Internet has one

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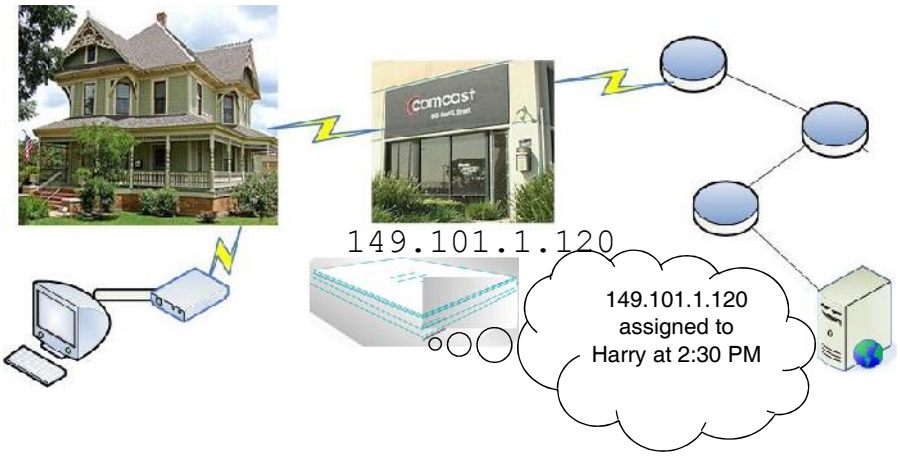
Assigning IP addresses

Assigned to home users by their ISP



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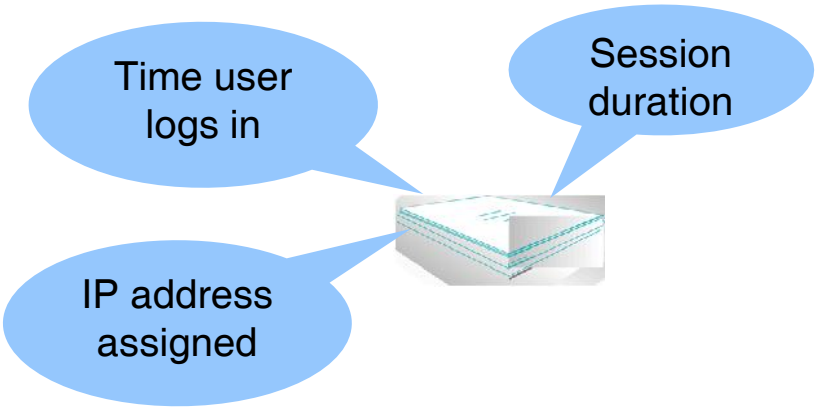
ISP logs

ISPs keep track



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Investigative Techniques

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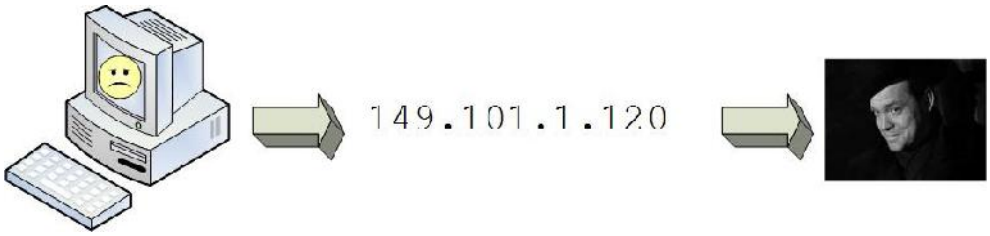
IP address as clue

Investigations focus on getting the IP address



Computer crime scene

IP address

Suspect

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Traceback

Learning who was using an IP address

149.101.1.120

?

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Traceback, Step 1

Use IP whois to learn the ISP for that address

149.101.1.120 → comcast

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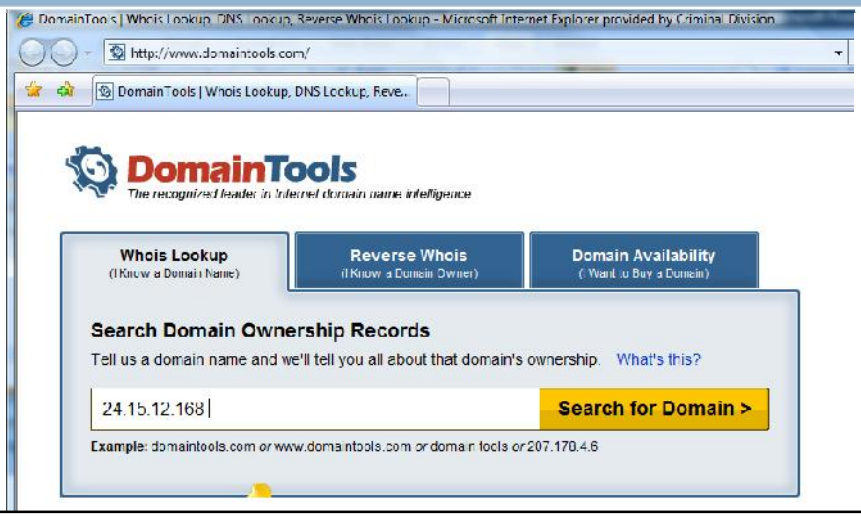
Using WHOIS to look up an IP

Easy way: www.domaintools.com



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Using WHOIS to look up an IP

Easy way: www.domaintools.com

IP Information for 24.15.12.168

IP Location:	United States Chicago Comcast Cable Communications
Resolve Host:	c-24-15-12-168.hsd1.il.comcast.net
IP Address:	24.15.12.168 W R P D T
Blacklist Status:	Clear

```
OrgName:    Comcast Cable Communications, Inc.
OrgID:      CMCS
Address:    1800 Bishops Gate Blvd
City:       Mt Laurel
StateProv:  NJ
PostalCode: 08054
Country:    US
```

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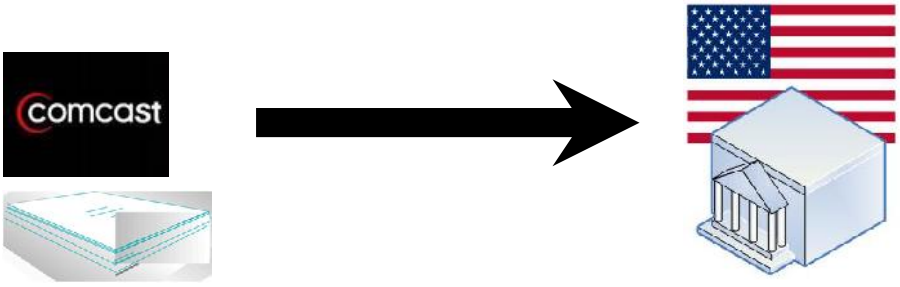
Get the logs from Comcast

Ask them who had that IP address



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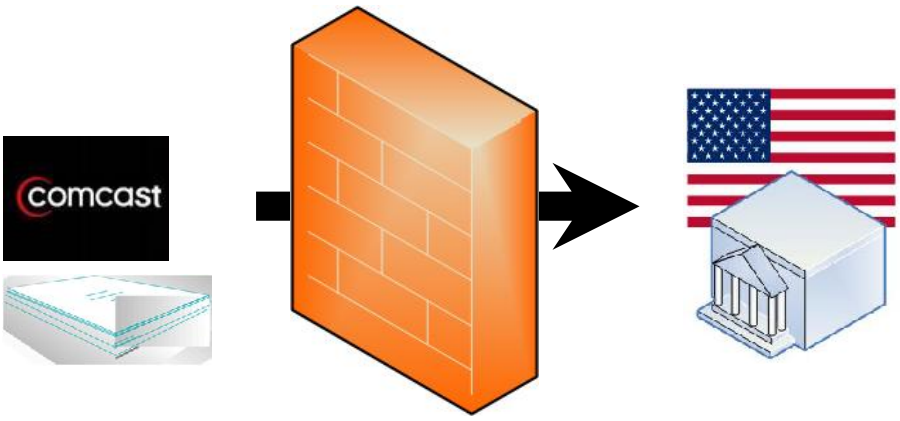
Introducing ECPA

Electronic Communications Privacy Act
(18 U.S.C. § 2701-11)



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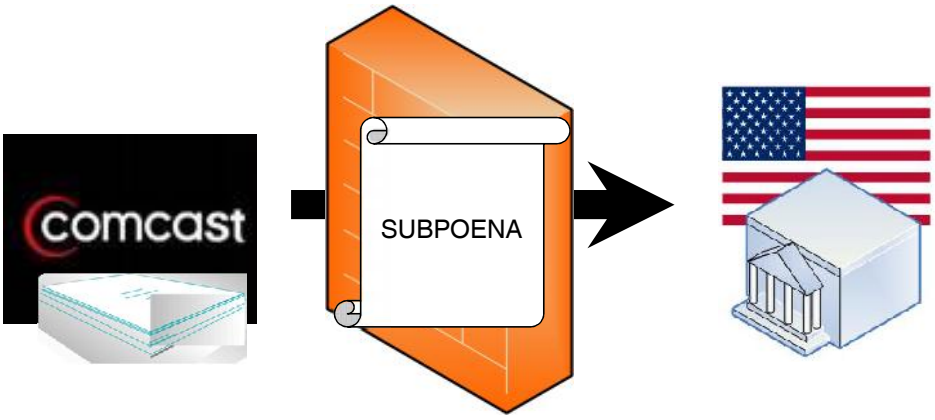
ECPA and the Traceback

Use a subpoena to get subscriber info



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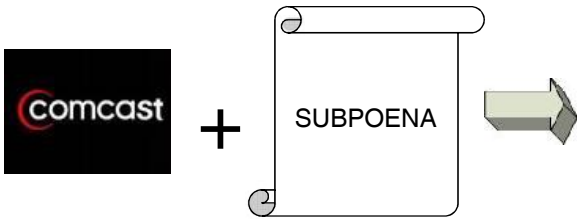
Traceback, ideally

Now, the ISP can tell you who it was



Harry Lime
225 W. 57th Street
New York, NY

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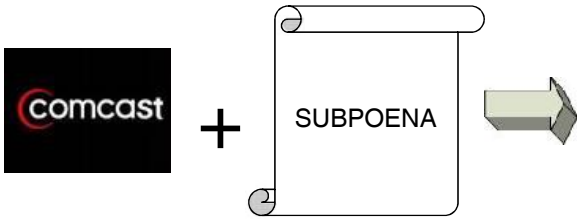
Complications

What if it isn't this easy?



Foreign country, questionable ISP

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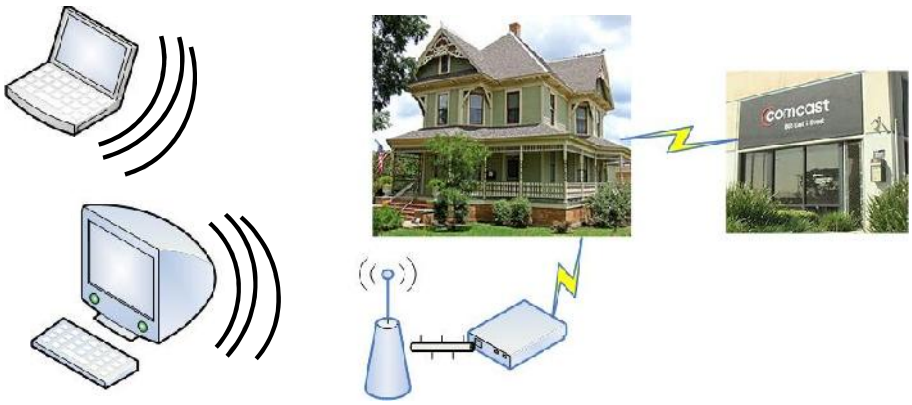
Wireless (Wi-Fi) Internet

Using radio instead of cables



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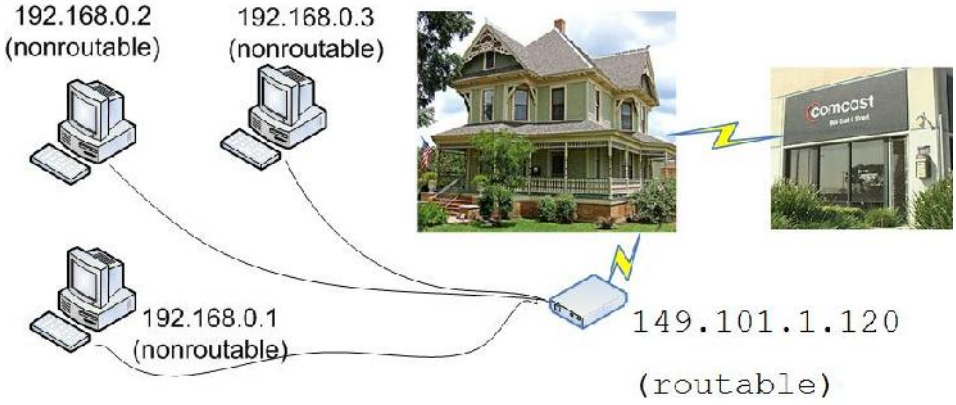
Network Address Translation

The NAT: Sharing IP addresses



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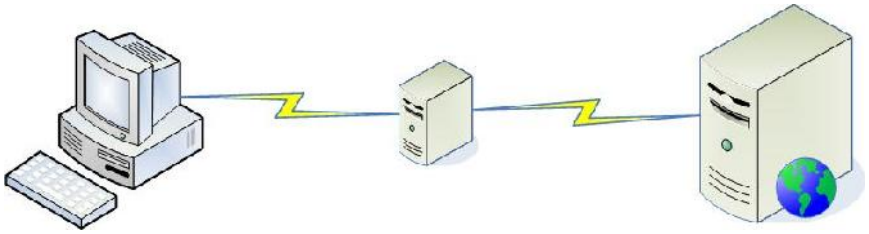
Proxy

Hiding IP addresses by using intermediaries



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Scenario

Scam e-mail sent. Who sent it?

Date: Thu, 22 Oct 2009 11:59:02 +0100
To: nospam@mailinator.com
From: admin@lottery.co.uk
Subject: WINNER OF UK LOTTERY USD$4.6M.

If you are the correct owner of this email address then be glad this day as the result of the UK lotto online e-mail address free-ticket winning draws of 29th August 2009 has just been released and we are glad to announce to you that your email address won

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Analyzing e-mail headers

Closer to the top = closer to the truth

Received: from qsmtp1.tiresrflat.info (unknown [174.127.82.151]) … ; Mon, 23 May 2011 15:05:22 -0400 (EDT)
Reply-To: <philmat58@yahoo.com.hk>
Date: Mon, 23 May 2011 14:05:23 -0500
To: nospam@mailinator.com
From: admin@lottery.co.uk
Subject: WINNER OF UK LOTTERY USD$4.6M.

If you are the correct owner of this email address …

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Look up that IP

Using our friend Domaintools

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Look up that IP

Using our friend Domaintools

IP Information for 174.127.82.151

IP Location:	United States Providence Hosting Services Inc
ASN:	AS36351
Resolve Host:	174.127.82.151.static.midphase.com
IP Address:	174.127.82.151 W R P D T

```
NetRange:       174.127.64.0 - 174.127.127.255
CIDR:           174.127.64.0/18
OriginAS:       AS32780
```

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Variety of Internet Crime

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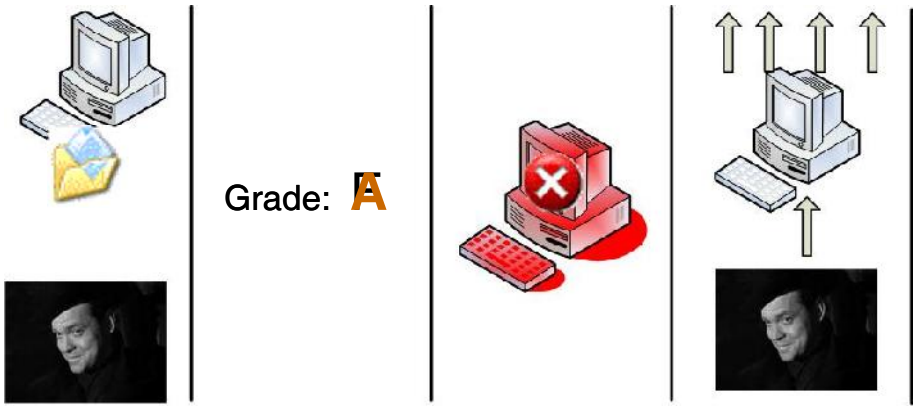
Hacking: The goals

Confidentiality, Integrity, Availability, and Use



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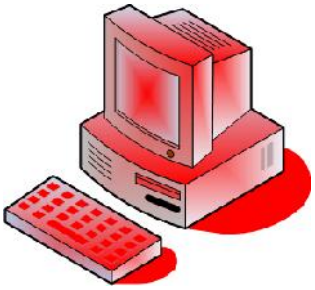
Vulnerabilities and exploits

Errors in code, and ways to take advantage

Xyq5%zZ[{/

abc
d



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Common vulnerabilities

Server software, applications

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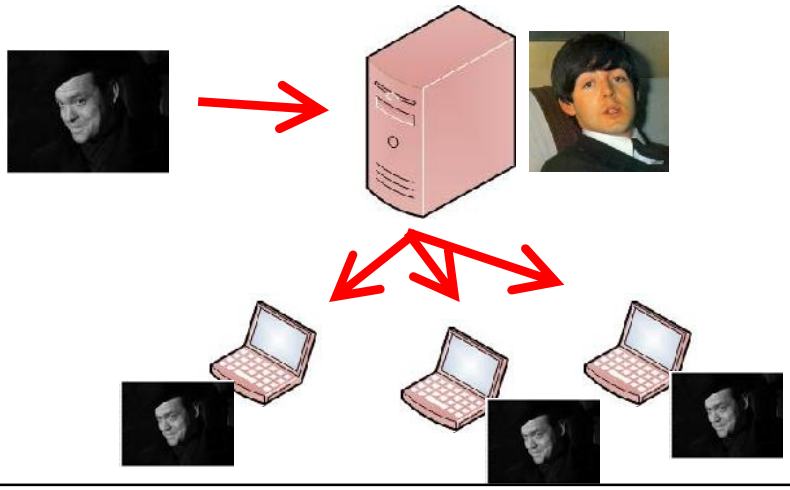
One hack leads to another



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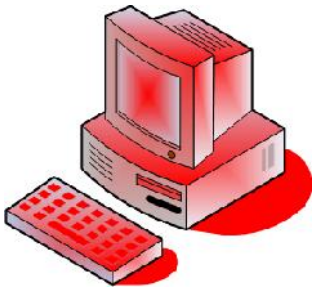
Bots

Personal computers



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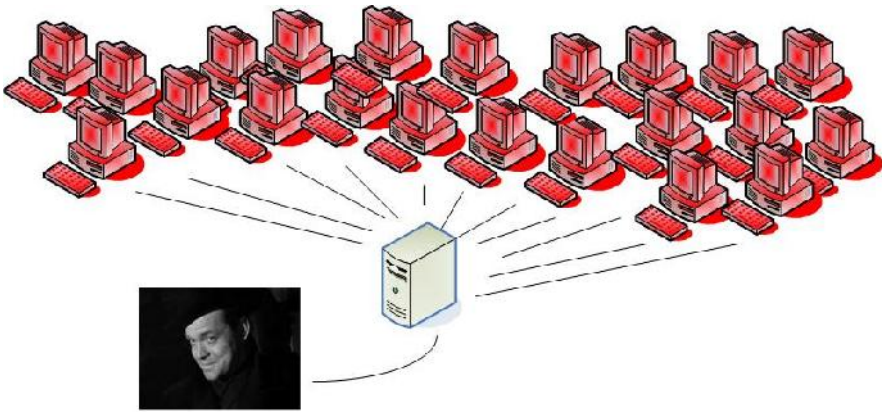
Botnets

Huge collections of bots



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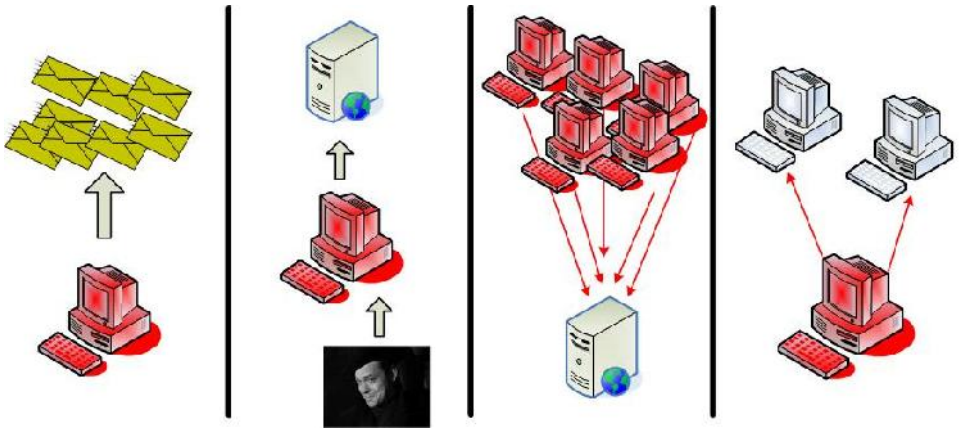
Uses for botnets

Spam; proxies; attacks; making more bots



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Peer-to-Peer file sharing (P2P)

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Review: the client/server model

The opposite of peer-to-peer

Send me
"www.tasteyoulove.com"

Client request

Server response

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What is Peer-to-Peer?

Sharing files, using servers as little as possible

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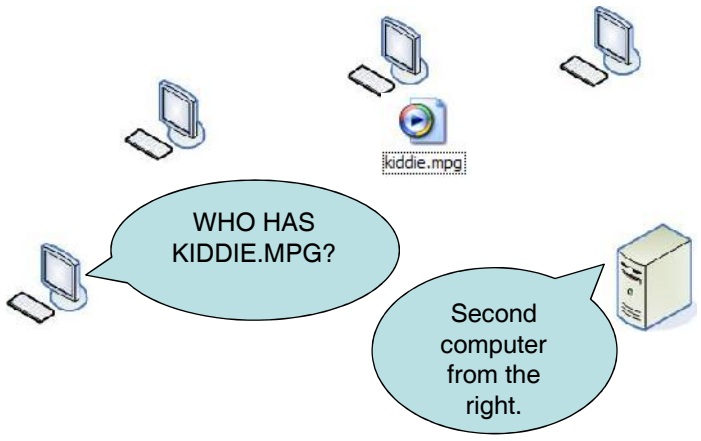
Old style P2P

Relied on a server to keep track of the peers



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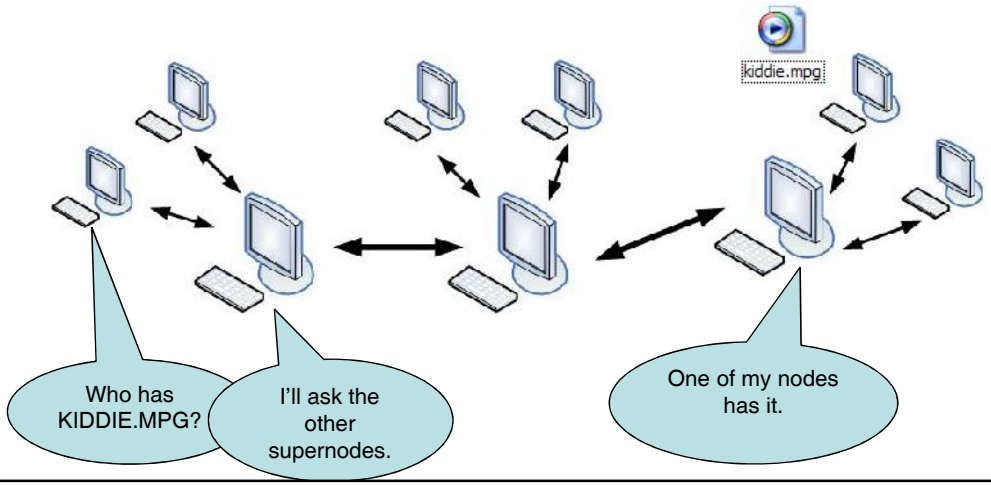
Newer style P2P

Uses “supernodes” instead of central servers



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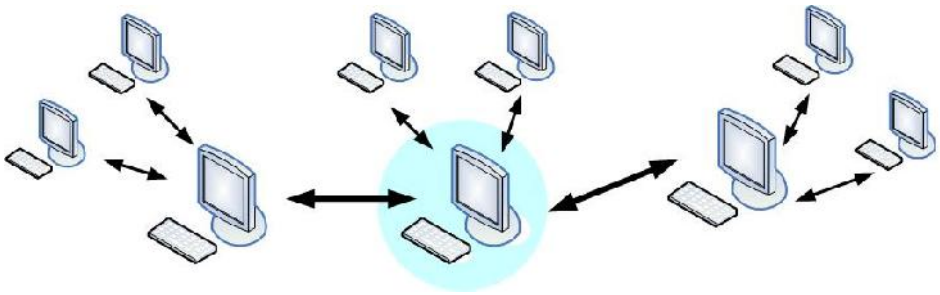
Investigating P2P

Done through undercover work



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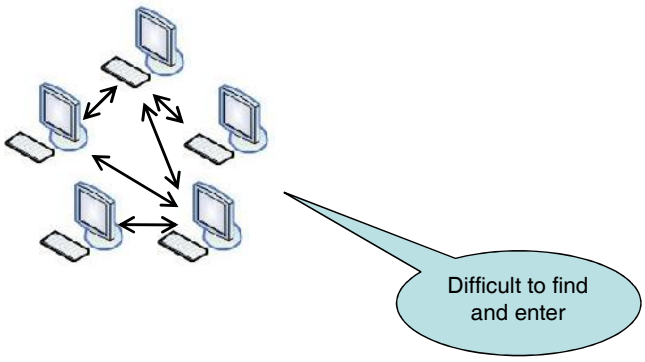
Today: Gigatribe and Darknets

Small, private communities sharing files



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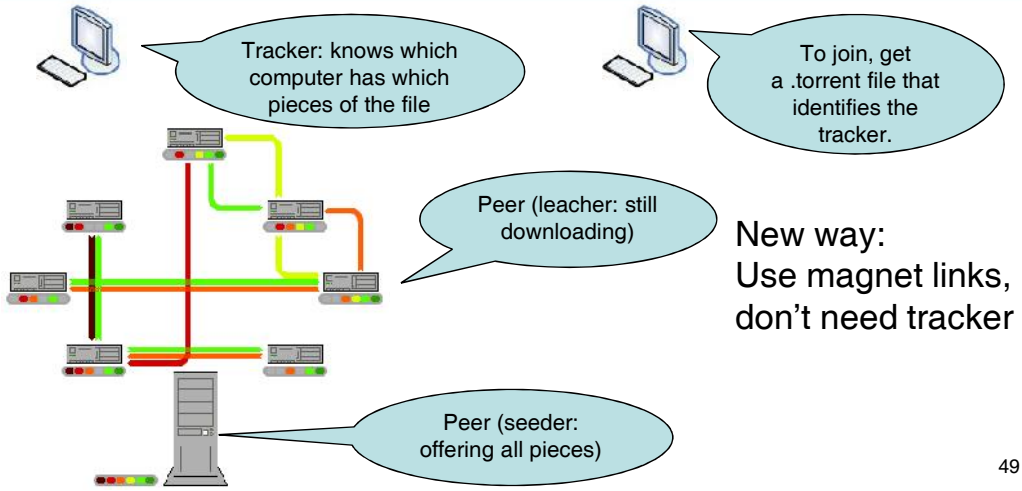
Today: BitTorrent

Efficient technology for a huge number of people to share huge files



New way:
Use magnet links, don't need tracker

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www.cybercrime.gov
Computer Crime and Intellectual Property Section
U.S. Department of Justice

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