

## History of Computer Crime

CSH6 Chapter 2
"History of Computer Crime"
M. E. Kabay
With supplemental updates

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### **Topics**

- ➤ Why study historical records?
- > Trends
- > 1960s / 70s Sabotage
- > Impersonation
- > Phone Phreaking
- ➤ Data Diddling
- **≻ Logic Bombs**
- > Troian Horses
- Notorious Worms and Viruses
- > Spam
- ▶ Denial of Service
- > Hacker Underground
- > Recent Developments

Recent Bevelopinents

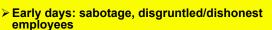
CSH6 Chapter 2

## Why study historical records?

- ➤ Common body of knowledge
- > Distinguish amateurs from professionals
- > Shared history of significant events
- > What has shaped development of field
- > Understand references from senior people
- > Put new events and patterns into perspective

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### **Trends**



- > Physical damage prominent threat until 1980s
- ➤ Unauthorized access common
- Telecommunications subversion popular in 1960s/70s
- ➤ Malicious software developed in 1980s
- > Fax-based fraud developed in 1980s (4-1-9)
- ➤ Growth of Internet multiplied threats
- Financial crime mediated by computers & networks grew in 1990s
- New malware types developed in 1990s
- Illegitimate uses of e-mail spawned spam, phishing, 4-1-9 e-mail fraud

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# Rough Guesses About Sources of Damage to IT Before 1993 Fire Dishonest Outsider Water Disgrunted Virus Fire Dishonest Outsider Water Disgrunted Virus/ worms/ Trojans MORAL: remember this fuzzy graph and don't trust precise statistics about computer crime!

### 1960s / 70s - Sabotage

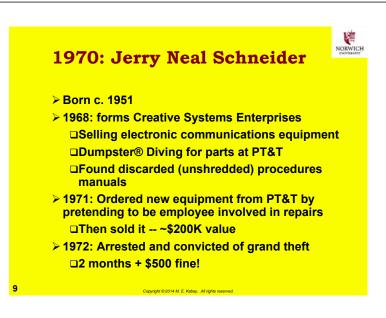


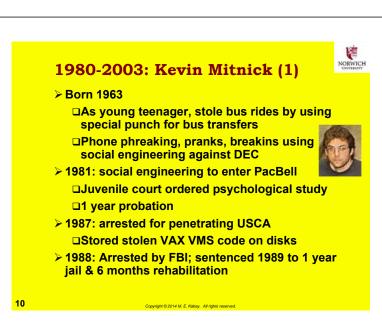
- Computers can be tools and targets of crime
  - □Also repositories of evidence
- > 1969.02 fire in computer center during student riot in Montréal, Québec, Canada
  - □Sir George Williams University (now Concordia)
  - □\$2M damages & 97 people arrested
- ➢ In 2001, survey by Novatech showed ~¼ of all computers had been physically assaulted by owner (4,200 respondents)

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## Albert the Saboteur (1970) National Farmers Union Service Corporation 1970-1972 Burroughs B3500 mainframe 56 hard disk head crashes in 2 years 8 hours average downtime \$500,000 electrical system repairs Crashes continued Suspicion fell on Albert the Operator Loyal employee Night shift for many years without letup Secret video-tape revealed sabotage Liked the excitement of having all those people around

# Impersonation - 1970: Jerry Neal Schneider - 1980-2003: Kevin Mitnick - 1970s-today: Credit Card Fraud - 1990s-today: Identity Theft Rises









### **Kevin Mitnick (4)**

KEVIN D. MITNICK

The Real Stories Behind

the Exploits of Hackers, Intruders & Deceivers

- Readings about the Mitnick case
  - □ Goodell, J. (1996). The Cyberthief and the Samurai: The True Story of Kevin Mitnick-and the Man Who Hunted Him Down. Dell (New York). ISBN 0-440-22205-2. xix + 328.
  - □ Hafner, K. & J. Markoff (1991). Cyberpunk: Outlaws and Hackers on the Computer Frontier. Touchstone Books, Simon 8 Schuster (New York). ISBN 0-671-77879-X. 368. Index.
  - □ Littman, J. (1996). The Fugitive Game: Online with Kevin Mitnick—The Inside Story of the Great Cyberchase. Little, Brown and Company (Boston). ISBN 0-316-5258-7. x +
  - □ Shimomura, T. & J. Markoff (1996). Takedown The Pursuit and Capture of Kevin Mitnick, America's Most Wanted Computer Outlaw—by the Man Who Did It. Hyperion (New York). ISBN 0-7868-6210-6. xii + 324. Index.



> Credit cards developed after WWII in USA

□1950: Diners Club

□1951: BankAmericard & MasterCard

□1958: American Express

➤ 1960s: aggressive marketing of credit cards □Sending cards to unsuspecting consumers □Mailbox theft → surprise bills on first invoice

> 1974: Fair Credit Billing Act to reduce abuses

> 1970s-80s: expansion of electronic confirmation

> 1980s: Refusal to improve security (no pictures)

### **Credit Card Fraud (2)**



- > 1990s: massive increase in credit card & online fraud □ US Visa/MC: \$110M in 1980 vs \$1,630M in 1995
- More recent data\*
  - ☐ Unauthorized general-purpose credit card transactions = 0.037% all card-present credit card transactions in 2012
  - ☐ Fraud = 0.092% value of transactions)
  - □ 0.118% all card-not-present transactions
  - □ 0.114% value those transactions)
  - ☐ Global fraud rates across Visa < \$0.06/\$100

< http://www.creditcards.com/credit-card-news/credit-card-industry-facts-personal-debt-statistics-1276.php > or < http://tinyurl.com/6hdtv6 >

### 1990s-now: Identity **Theft Rises**



- > One of the fastest growing crimes in USA
- ➤ Identity Theft Resource Center
  - □http://www.idtheftcenter.org/
  - □Wealth of resources
    - √ Victim resources
    - ✓ID theft protection tips
    - √ Scams & alerts
- > FBI ID Theft Resources
  - □http://www.fbi.gov/aboutus/investigate/cyber/identity theft
- Statistic Brain
  - □http://www.statisticbrain.com/identity-theft-fraudstatistics/

### What ID Thieves Do



- ➤ Locate identifying data
  - □Social Security Number
  - □Driver's License
  - □Home address, telephone number
  - □Mother's maiden name
  - □Or just misuse of handle (screen name) for forged messages
- Create new credit cards, bank accounts
- Default on loans in victim's name
- > Ruin reputations, credit records

### **Consequences for Victims**



- Credit-card expenses relatively easy to correct IFF
  - □Victim checks statement immediately and
  - □ Reports questionable transactions within time limit
- > Bank-account thefts much more difficult to correct
  - □Money stolen is client's, not bank's
  - □Client has great difficult recovering funds
- > Bill-collectors hound victims relentlessly
- > Bad credit records difficult to correct, ruin plans, cause loss of jobs or interfere with hiring
- Criminal accusations put victims at serious risk of erroneous arrest or deportation
- Victims may be nailed for child support of total strangers

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### **Preventing ID Theft**

- Prevent theft: restrict access to your SSN and other personal data
  - □SSN may be required by SSA, IRS employer, financial institution, lender
  - □Corner store or video rental should NOT be given SSN
- ➤ NEVER give out credit-card or other personal data over the phone to someone who has called you. Ask for written documents.
- > Shred papers that include confidential info before discarding.
- Destroy computer media before discarding.
- Don't use DEBIT cards to buy things

### **Phone Phreaking**

- Phone + freak = phreak
- > 1950s: Single-frequency signals communicated control instructions to central switches (computers)
- Generating external tone could fool switch
- 2600 Hz tone generated by whistling. flute or whistle in Captain Crunch cereal box
  - □ Hence John Draper phreak became known as Cap'n Crunch
  - □Able to initiate free long-distance
  - □Interviewed by Equire 1971 about phreaking - arrested & convicted
  - □Eventually jailed for wire fraud in



### **Data Diddling**

- Unauthorized modification of data
- > Changes can occur
- □Before data input
- □During data input
  - **□Before output**
- > Records affected have included
  - □Bank records
  - □Payrolls
  - □Inventory data
  - □Credit records
  - □School transcripts
  - □Telephone switch configurations....

## **Data Diddling:**

The Equity Funding Fraud

Equity Funding Corporation of America From early 1960s to 1973, immensely successful

□Buy insurance +/invest/in mutual funds

In 1964, computer problem prevented printing final

JITY TIJINGGGREORATION GFAMERICA expected profit

□Profit failed to materialize

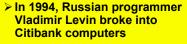
Invented false insurance policies to make up difference

Eventually "killed" nonexistent policy holders to collect payouts (\$MILLIONS)

> Discovered 1972 by SEC; officers went to jail

EQUITY FUNDING CORPORATION OF AMERICA

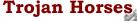
### **Data Diddling:** Vladimir Levin vs Citibank



- □Transferred ~\$12M to various international bank accounts
- ➤ Spotted after 1st \$400.000 transferred in July 1994
- Citibank cooperated with FBI & Interpol
- Levin & gang eventually arrested and tried
- ➤ Convicted 1998 to 3 years prison
- Citibank hired banking industry's first CISO, Stephen R. Katz







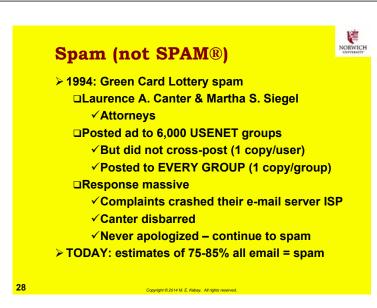
- > Program with apparently useful function
  - □But which has hidden harmful functions
- Can be triggered by either
  - □Change of state (logic bombs)
    - ✓E.g., removal of employee status for programmer
  - □Date/Time (time bombs)
- > May provide for covert access
  - □ Back door
  - □AKA trap door
  - □E.g., BackOrifice & BO2K released by Dildog, criminal hacker in cDC (Cult of the Dead Cow

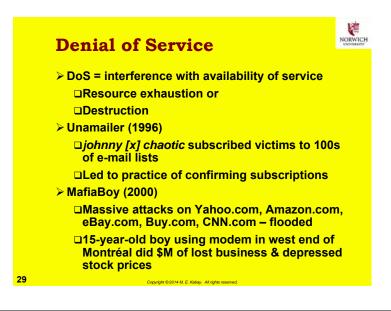
cîtibank

## Logic Bombs Jerusalem Virus of 1988 Duplicated itself every Friday and on 13th of month On every Friday 13th after May 13, 1988, corrupted all available disks on system PC Cyborg AIDS information diskette Actually encrypted directories, filled C: drive, intercepted commands Linked to extortion demand for money



# Stuxnet Worm > July 2010 > Zero-day threat to SCADA □ Siemens Simatic WinCC & PCS7 □ Designed for industrial espionage □ Also for sabotage > Thought to have been developed by USA and Israel by 2007 > Found in ~100,000 computers □ Iran, Indonesia, Inda □ Iranian nuclear power program affected ✓ Centrifuges ran too fast

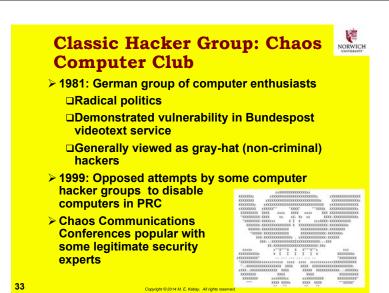






## Criminal-Hacker Subculture > Who? | Children (sub-teens, teens) | Adults (fewer after 18 years of age) | Amateurs | "3133T" (elite) hackers | Professionals | Organized crime > What | Publications, USENET groups, lists | Local meetings, conventions | Jargon (133T5p33k)











### **Phrack**

- > http://www.phrack.com/
- > 1st edition Nov 1985
- Originally focused on phreaking
- Entirely electronic on BBS systems
- Eds: Knight Lightning (Craig Neidorf) & Taran King (Randy Tischler)
- ➤ Phrack 24 involved in Operation Sundevil (1990)

  □ Published E911 docs
  - □Actually public docs!



### **Masters of Deception (MOD)**

- > 1989-1992 New York criminal hacker group
  - □ Phiber Optik (Mark Abene)
  - □Highly visible in media
    - √ Harper's
    - ✓ Esquire
    - ✓ New York Times
    - √TV (Geraldo)
  - □Eventually arrested,
    - □Tried for violation of CFA [18 USC §1030(a)]
    - □Sentenced to 1 year in prison

Commissed © 2011

### **Gray-Hat Hackers (1)**

- Black-Hats: criminal hackers
  - □lgnore laws
  - □Test for and exploit vulnerabilities without authorization
  - □Publicize vulnerabilities without delay for repair
  - □Sometimes amateurish; may be experts
- > White-Hats: penetration testers
  - □Authorized to test by owners of systems
  - □Maintain confidentiality and professionalism
  - □Sometimes hide-bound; may be imaginative

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### **Gray-Hat Hackers (2)**

- Gray-Hats: professionals with black-hat backgrounds and attitudes
  - ☐ May have been members of criminal-hacking organizations
  - ☐ May continue to use hacker handles (pseudonyms)
- > 2000-01: L0pht members join @Stake
  - 8 members of L0pht Heavy Industries
  - □ Continued to use hacker handles (e.g., Mudge, Weld Pond, Brian Oblivion, Dildog...)
- > Described in glowing terms by some reputable experts
  - □ NTBugtraq's Russ Cooper: "The eight brilliant geniuses down at the L0pht. . . ."
- ➤ Other commentators not impressed
  - □ John Taschek of PC Week: "...L0pht's history shows that the group is not ethical, maintained practices that bordered on being illegal and is simply downright scary...."

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### Web Vandalism Classics

- > CIA (1996.09)
- > USAF (1996.12)
- > NASA (1997.03)
- > AirTran (1997.09)
- **> UNICEF (1998.01)**
- ➤ US Dept Commerce (1998.02)
- ➤ New York Times (1998.09)
- ➤ SETI site (1999)
- > Fort Monmouth (1999)
- > Senate of the USA (twice)(1999)
- **> DEFCON 1999 (!)**

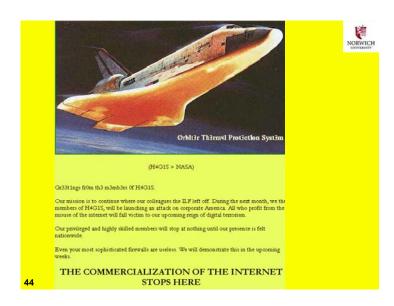


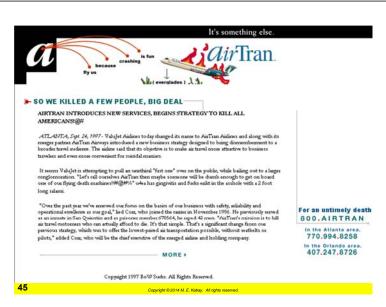


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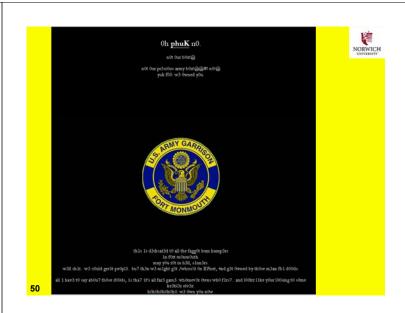












Senate of the USA (1) (1999)

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\*\*BIG UP 2:\*\*
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THE \*\*YSERSO (COS)\*\* MYSERIOR

ALL THE \*\*FORDS AT BROOK.MILE\*





### **Hacker Conventions**

- NORWICH
- ➢ Blackhat < <a href="http://www.blackhat.com/">http://www.blackhat.com/</a> >
- > DefCon < http://www.defcon.org/ >
- > HOPE (Hackers on Planet Earth) < http://www.hopenumbernine.net/ >

### Criminal Hacking Gets Organized



- ➤ Profitable, low risk
- ▶ International gangs successful
  - □Russian Business Network (RBN)
  - □Bradley Guinen (NU BSCSIA 2013)
    - ✓ CJ341 paper published in Network World Security Strategies with Kabay

http://www.mekabay.com/nwss/866\_russian\_cybercrime\_(guinen)\_part\_1.pdf http://www.mekabay.com/nwss/867\_russian\_cybercrime\_(guinen)\_part\_2.pdf http://www.mekabay.com/nwss/868\_russian\_cybercrime\_(guinen)\_part\_3.pdf

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### Chinese Cyberwar



- Significant increase in industrial espionage by PRC
- ➤ Full-time hackers employed by state
- ▶ Log off during weekend!
- > Attacks, penetration, infiltration, IP theft
- ➤ See Chapter 14 from CSH6.

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## **DISCUSSION**

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