Hacker Techniques, Tools, and Incident Handling

Chapter 1
Hacking: The Next Generation

Learning Objective

- Explore the history and current state of hacking and penetration testing, including their ethical and legal implications.

Key Concepts

- Birth and evolution of hacking
  - 1960s: individuals of technology enthusiasts, motivated by intellectual curiosity
  - 1980s: started gaining negative connotations, altering image of a hacker to a computer criminal, theft of service
- Ethical hacking and penetration testing in relation to black- and white-hat activities
- Laws and ethical standards for penetration testers and ethical hackers

Types of Hackers

- **Script kiddies** are beginners and possess basic skills.
- **Black hats** break into computer systems or use them without authorization.
- **Gray hats** walk the line between legal and illegal actions.
- **White hats** are employed to break security to expose vulnerability.
- **Suicide hackers** do not care if they get caught; goals include political, terrorist, or other aims.

TAP Principle of Controls

Technical:

software/hardware such as IDS, IPS, authentication, permissions, auditing, etc.

Administrative:

policies and procedures such as password policy, legal requirements, etc.

Physical:

locks, cameras, fences, gates, etc.

Hacker Motives

Monetary
Financial gains

Status
Gaining recognition

Terrorism
Scare, intimidate, or cause panic

Revenge
disgruntled employee/customer

Hacktivism
Bring attention to a cause or group

Fun
No specific goal, indiscriminate

Common Attacks (1)

- Theft of access: stealing passwords, subverting access mechanisms to bypass normal authentication
- Network intrusions: accessing a system of computers without authorization
- Emanation eavesdropping: intercepting radio frequency signals
- Social engineering: telling lies to manipulate people into divulging information they otherwise would not provide
- Posting and/or transmitting illegal material
- Fraud: intentional deception to produce illegal financial gain or damage another party
- Software piracy: violation of a license agreement, removing copy protection

Common Attacks (2)

- Dumpster diving: gathering discarded materials
- Malicious coding: software written to cause damage, destruction, or disruption; viruses, worms, spyware, Trojan horses
- Denial of service (DoS) and distributed DoS attacks: overloading a system's resources not to provide required services
- IP address spoofing: substituting a forged IP address for a valid address in network traffic or a message to disguise the true location of the message or person
- Unauthorized destruction or alteration of information
- Embezzlement: a financial fraud (theft, redirection of funds)
- Data-diddling: unauthorized modification of data
- Logic bomb: a piece of code designed to cause harm, intentionally inserted into software system

History of Hacking

1990s

1980s

- Hacking as skillful modification of systems
- Early Viruses, Phone Phreaking
- First Hacker Groups, Bulletin Boards
- First Hacking Conference, Polymorphic Codes in Viruses
-

1970s

Pre 1970

Famous Hacks over Time

- 1988 Robert T. Morris: the first Internet worm
- 1999 David L. Smith: Melissa virus
- 2001 Jan de Wit: Ana Kournikova virus
- 2004 Adam Botbyl: steal credit card info
- 2005 Cameron Lacroix: hacking phone

Famous Hackers and Groups

- **Individual Hackers**:
  - Kevin Poulsen, Frank Abagnale, Kevin Mitnick
- **Groups**:
  - **Black Hats**:
    - The Cult of the Dead Cow (cDc), Legion of Doom
  - **White Hats**:
    - The Internet Storm Center, InfraGard

Modern Hacking and Cybercriminals

- Transformation of hobbyist hacking to cybercrime
- Cybercriminals seeking profits by aiming at financial data, industry information, and other valuable targets
- Emergence of national laws to counter cyber attacks

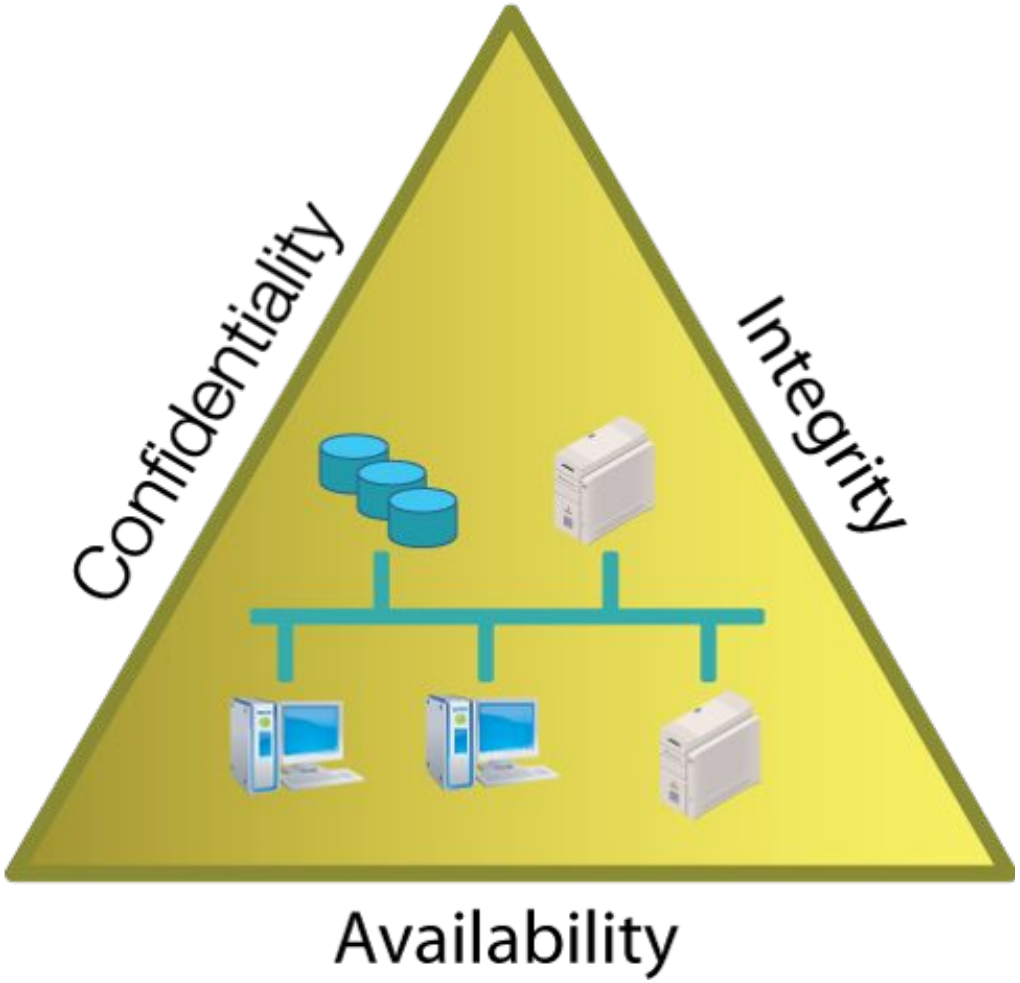
Ethical Hacking and Penetration Testing

- **Ethical hackers** require permission to engage in penetration testing
- **Penetration testing** is the structured and methodical means of investigating, uncovering, attacking, and reporting on a target system's strengths and vulnerabilities
- Penetration tests are commonly part of **IT audits**

Key Points about Ethical Hacking

- It requires explicit permission of “victim”
- Participants use the same tactics and strategies as regular hackers
- It can harm a system if you do not exercise proper care
- It requires detailed advance knowledge of actual techniques a regular hacker will use.
- It requires that rules of engagement or guidelines be established prior to any testing

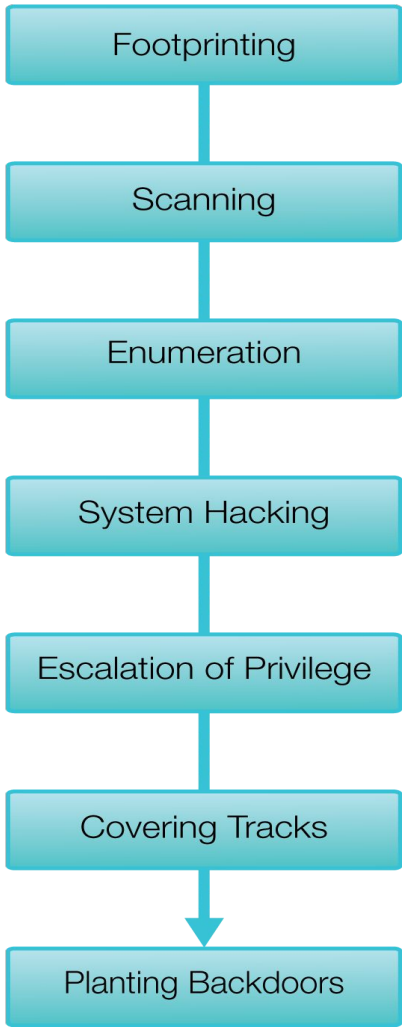
C-I-A Triad



C-I-A Triad

- Confidentiality: safeguarding information or services against disclosure to unauthorized parties
- Integrity: ensuring that information is in its intended format or state, i.e., ensuring that data is not altered
- Availability: ensuring that information or a service can be accessed or used whenever requested
- Anti-triad
- Disclosure: Information is accessed by an unauthorized party
- Alteration: Information is maliciously or accidentally modified
- Disruption: Information and/or services are not accessible or usable when called upon

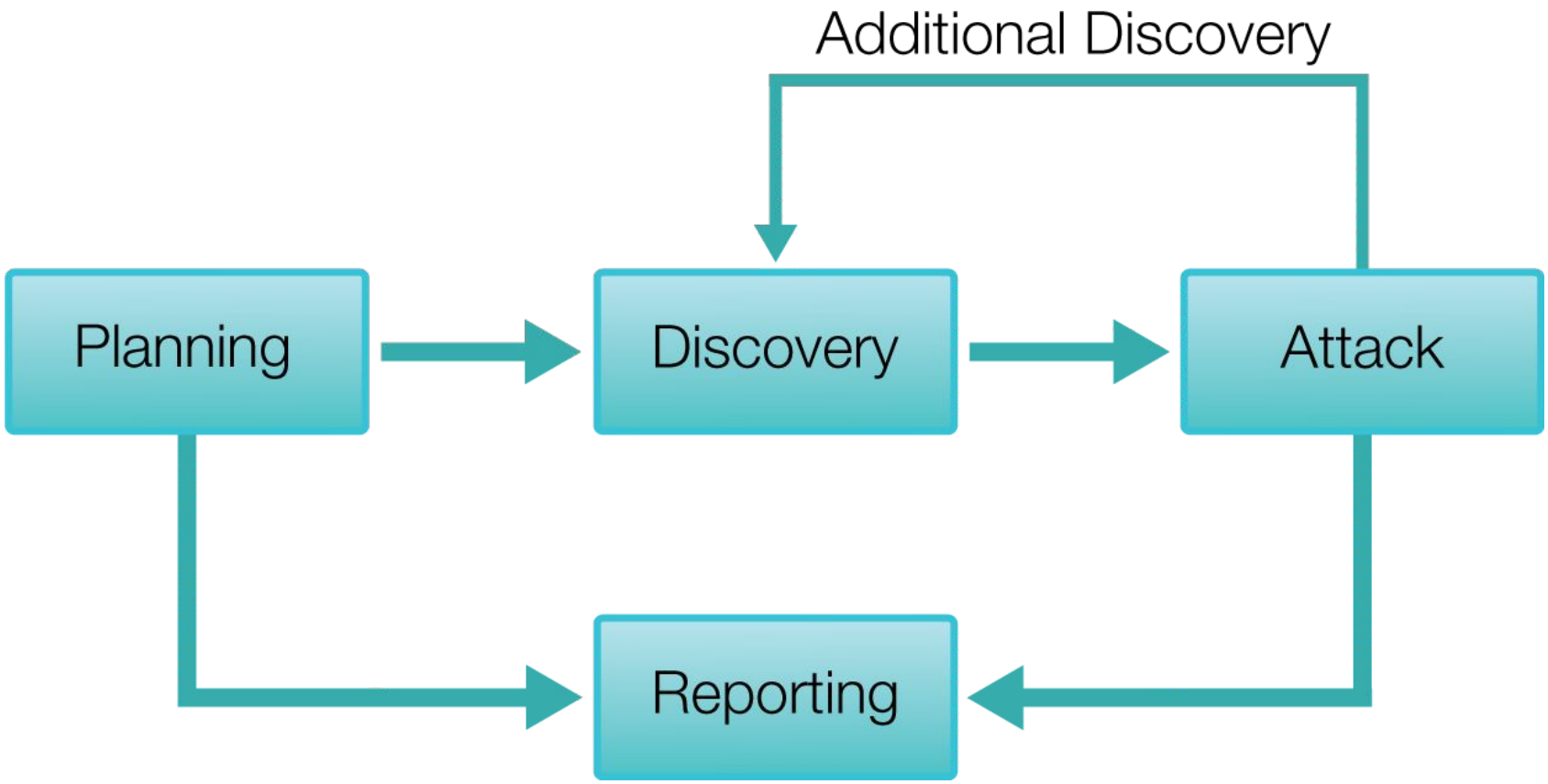
Common Hacking Methodologies



Hacking Methodologies

- Footprinting: An attacker passively acquires information about the intended victim's system
- Scanning: actively acquire more detailed information about a victim; a ping sweep of all victim's known IP addressed to see which machines respond
- Enumeration: extract more-detailed and useful information from a victim's system
- System hacking: actively attack a system
- Escalation of privilege: obtains privileges on a given system higher than should be permissible
- Covering tracks: purging information from the system to destroy evidence of a crime
- Planting backdoors: for later use

Penetration Testing Flow



Performing a Penetration Test

- Next logical step beyond ethical hacking
- Require rules to be agreed upon in advance
- NIST 800-42 Guideline on network security testing
- Technical attack
- Administrative attack
- Physical attack

Laws and Ethical Standards

- Ethical hackers should exercise proper care not to violate the rules of engagement
- When considering breaking guidelines
  - Trust: questioning of other details
  - Legal action against ethical hacker
- Regulations
  - Computer Fraud and Abuse Act
  - U.S. Communications Assistance for Law Enforcement Act
  - Sarbanes-Oxley Act (SOX)
  - Federal Information Security Management Act (FISMA)

Summary

- Birth and evolution of hacking
- Ethical hacking and penetration testing in relation to black- and white-hat activities
- Laws and ethical standards for penetration testers and ethical hackers