SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-IOT Including CS&BCT

COURSE NAME : 19SB402 NETWORKING AND CYBERSECURITY

II YEAR / IV SEMESTER

Unit V- **CYBER ANALYSIS**

Topic :Mobile security and common vulnerabilities

- Mobile Security as a concept deals with the protection of our mobile devices from possible attacks by other mobile devices, or the wireless environment that the device is connected to.
- Following are the major threats regarding mobile security −
- **Loss of mobile device.** This is a common issue that can put at risk not only you but even your contacts by possible phishing.
- **Application hacking or breaching.** This is the second most important issue. Many of us have downloaded and installed phone applications. Some of them request extra access or privileges such as access to your location, contact, browsing history for marketing purposes, but on the other hand, the site provides access to other contacts too. Other factors of concern are Trojans, viruses, etc.
- Smartphone theft is a common problem for owners of highly coveted smartphones such as iPhone or Android devices. The danger of corporate data, such as account credentials and access to email falling into the hands of a tech thief is a threat.

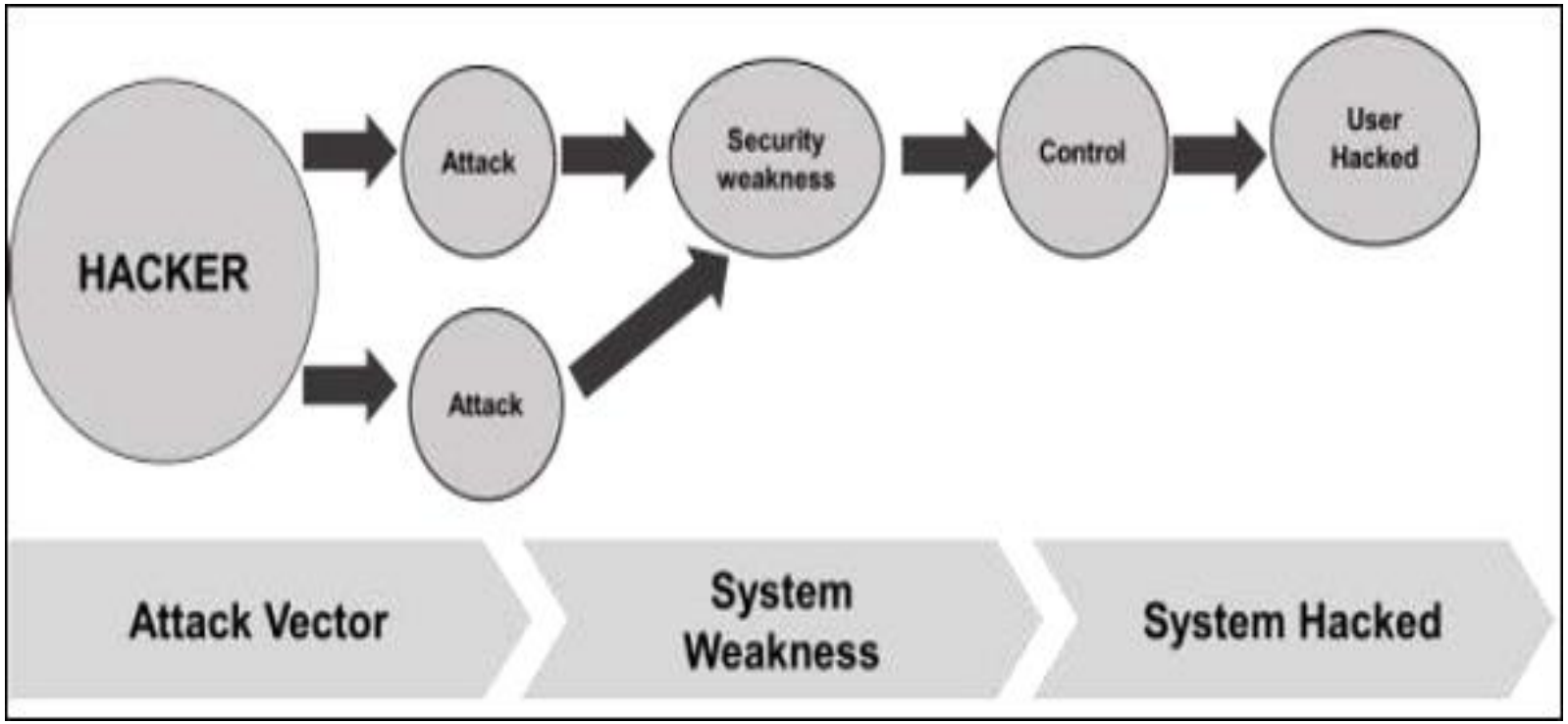
Mobile Security - Attack Vectors

An **Attack Vector** is a method or technique that a hacker uses to gain access to another computing device or network in order to inject a “bad code” often called **payload**.

This vector helps hackers to exploit system vulnerabilities.

Many of these attack vectors take advantage of the human element as it is the weakest point of this system.

Following is the schematic representation of the attack vectors process which can be many at the same time used by a hacker.


HACKER
Attack
Attack
Security weakness
Control
User Hacked
Attack Vector
System Weakness
System Hacked

Some of the mobile attack vectors are −

Malware

- Virus and Rootkit
- Application modification
- OS modification

Data Exfiltration

- Data leaves the organization
- Print screen
- Copy to USB and backup loss

Data Tampering

- Modification by another application
- Undetected tamper attempts
- Jail-broken devices

Data Loss

- Device loss
- Unauthorized device access
- Application vulnerabilities

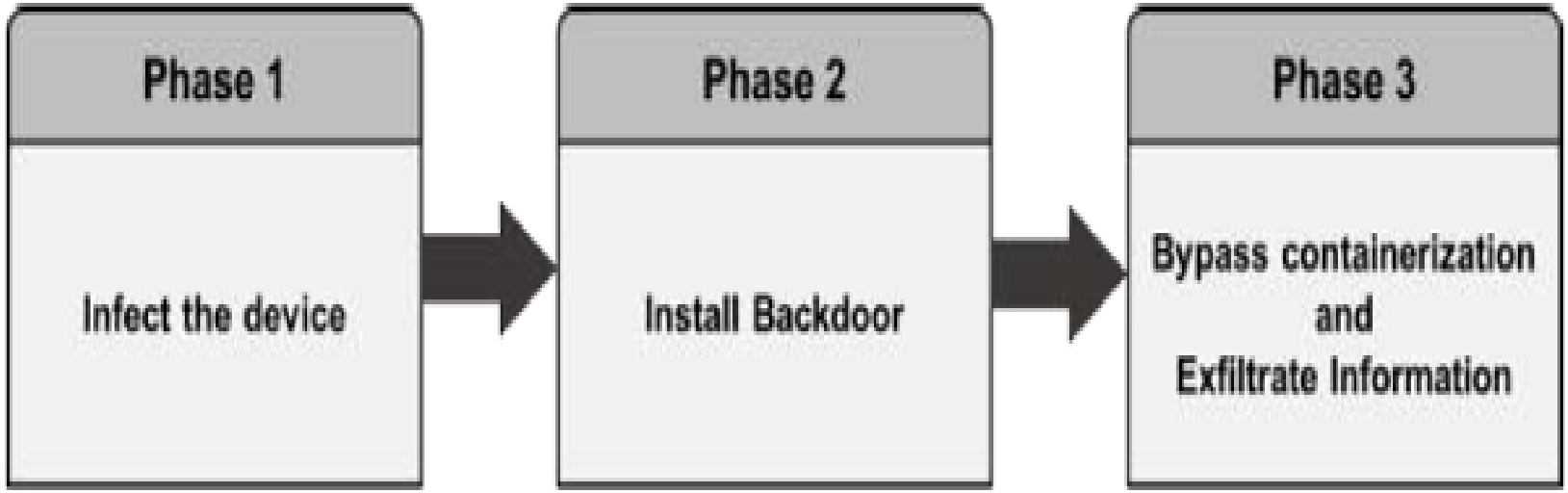
Consequences of Attack Vectors

Attack vectors is the hacking process as explained and it is successful, following is the impact on your mobile devices.

- **Losing your data** − If your mobile device has been hacked, or a virus introduced, then all your stored data is lost and taken by the attacker.
- **Bad use of your mobile resources** − Which means that your network or mobile device can go in overload so you are unable to access your genuine services. In worse scenarios, to be used by the hacker to attach another machine or network.
- **Reputation loss** − In case your Facebook account or business email account is hacked, the hacker can send fake messages to your friends, business partners and other contacts. This might damage your reputation.
- **Identity theft** − There can be a case of identity theft such as photo, name, address, credit card, etc. and the same can be used for a crime.

Anatomy of a Mobile Attack

Following is a schematic representation of the anatomy of a mobile attack. It starts with the infection phase which includes attack vectors.



Infecting the device

Infecting the device with mobile spyware is performed differently for Android and iOS devices.

Android − Users are tricked to download an app from the market or from a third-party application generally by using social engineering attack.

Remote infection can also be performed through a Man-in-the-Middle (MitM) attack, where an active adversary intercepts the user's mobile communications to inject the malware.

iOS − iOS infection requires physical access to the mobile. Infecting the device can also be through exploiting a zero-day such as the JailbreakME exploit.

Installing a backdoor

To install a backdoor requires administrator privileges by rooting Android devices and jailbreaking Apple devices.

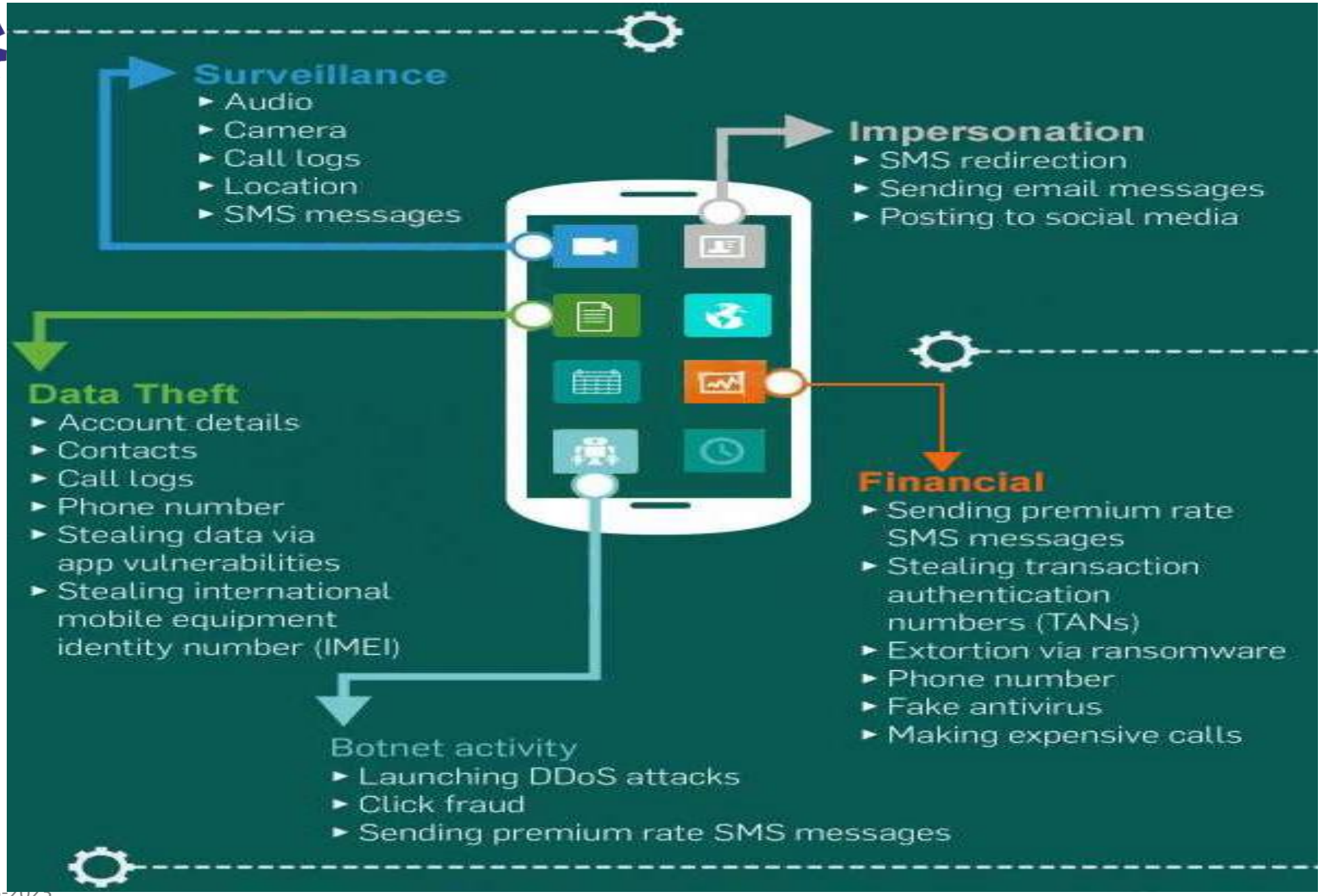
Despite device manufacturers placing rooting/jailbreaking detection mechanisms, mobile spyware easily bypasses them

Android − Rooting detection mechanisms do not apply to intentional rooting.

iOS − The jailbreaking “community” is vociferous and motivated.

Bypassing encryption mechanisms and exfiltrating information

- Spyware sends mobile content such as encrypted emails and messages to the attacker servers in plain text.
- The spyware does not directly attack the secure container.
- It grabs the data at the point where the user pulls up data from the secure container in order to read it.
- At that stage, when the content is decrypted for the user's usage, the spyware takes controls of the content and sends it on.


Surveillance
Audio
Camera
Call logs
Location
SMS messages
Impersonation
SMS redirection
Sending email messages
Posting to social media
Data Theft
Account details
Contacts
Call logs
Phone number
Stealing data via app vulnerabilities
Stealing international mobile equipment identity number (IMEI)
Financial
Sending premium rate SMS messages
Stealing transaction authentication numbers (TANs)
Extortion via ransomware
Phone number
Fake antivirus
Making expensive calls
Botnet activity
Launching DDoS attacks
Click fraud
Sending premium rate SMS messages

OWASP Mobile Top 10 Risks

When talking about mobile security, we base the vulnerability types on OWASP which is a not-for-profit charitable organization in the United States, established on April 21.

OWASP is an international organization and the OWASP Foundation supports OWASP efforts around the world.

For mobile devices, OWASP has **10 vulnerability classifications**.

M1-Improper Platform Usage

This category covers the misuse of a platform feature or the failure to use platform security controls.

M2-Insecure Data

This new category is a combination of M2 and M4 from Mobile Top Ten 2014. This covers insecure data storage and unintended data leakage.

M3-Insecure Communication

This covers poor handshaking, incorrect SSL versions, weak negotiation, clear text communication of sensitive assets, etc.

M4-Insecure Authentication

This category captures the notions of authenticating the end user or bad session management. This includes −

- Failing to identify the user at all when that should be required
- Failure to maintain the user's identity when it is required
- Weaknesses in session management

M5-Insuficient Cryptography

The code applies cryptography to a sensitive information asset. However, the cryptography is insufficient in some way.

M6-Insecure Authorization

This is a category to capture any failures in authorization (e.g., authorization decisions in the client side, forced browsing, etc.)

M7-Client Code Quality

This was the "Security Decisions Via Untrusted Inputs", one of our lesser-used categories.

M8-Code Tampering

This category covers binary patching, local resource modification, method hooking, method swizzling, and dynamic memory modification.

M9-Reverse Engineering

This category includes analysis of the final core binary to determine its source code, libraries, algorithms, and other assets.

M10-Extraneous Functionality

Often, developers include hidden backdoor functionality or other internal development security controls that are not intended to be released into a production environment.

Any Query????

Thank you……