Mobile Security Behavior Observatory: Long-term Monitoring of Mobile User Behavior

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Introduction

- Motivated by previous long-term observation of user activity on desktop computers
  - No equivalent platform for mobile devices
- Advantages of monitoring smartphones
  - Increasingly users browse the web on their phones
  - Can deploy application at a larger scale
- Challenges
  - Application must be lightweight for mobile
  - Cannot interfere with normal smartphone use
- Applied findings from SBO (desktop) research
  - Limited data collection while retaining metrics that captured user behavior

Data Collection

Data	Description
Web Browsing Behavior	URLs visited and anchor tag text in displayed web pages on Google Chrome and Chrome component applications
Application Usage History	Application usage history and activity history
Installed Applications	List of installed application names, hash values, and certificates
Network Type	Cellular data or Wi-Fi connection and Public IP address
SMS	URLs embedded in SMS messages and fuzzy hashes of these messages
Device Info	Device name, OS version, and patch level
Security Actions	3rd party app installation

Animation Character Incentive



Published App on Google Play Store



Character icon on home screen

Recruitment

- **Non-Monetary Incentive**
  - Animation character offered as incentive to download app
  - Character displayed on home screen
  - Customizable colors and animations
  - Character also interacts with participant
- **Recruitment Process**
  - Completely anonymous
  - Announced the study on 8 web sites related to project
  - Published the application on Google Play Store
  - Deployed portal site that describes user study and privacy policy

Initial Result

- **Non-Monetary Incentive**
  - Animation character offered as incentive to download app
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Research Application

- **Validation of Previous Work**
  - Recreate studies of browsing behavior and device usage
  - Compare mobile vs. desktop
  - Identify differences across time, device, and culture
- **Future Research Questions**
  - How do users update the OS and apps on their smartphone?
  - How are mobile devices infected by malware?
  - Which user behavior leads to malware exposure?
  - What opportunities are there to correct or mitigate bad security behavior?
  - How do non-monetary incentives affect participation?

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