

“Won’t Somebody Think of the Children?”

Examining COPPA Compliance at Scale

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Flashlight

Version 8.6.0 may request access to



Location

- access approximate location (network-based)
- access precise location (GPS and network-based)



Phone

- read phone status and identity



Storage

- read the contents of your USB storage

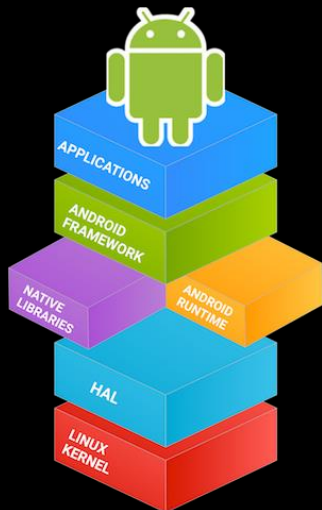


Other

- have full network access
- Google Play billing service
- receive data from Internet
- view network connections
- view Wi-Fi connections

dynamic analysis platform to observe
how apps **actually access and share** data

custom android for logging api calls



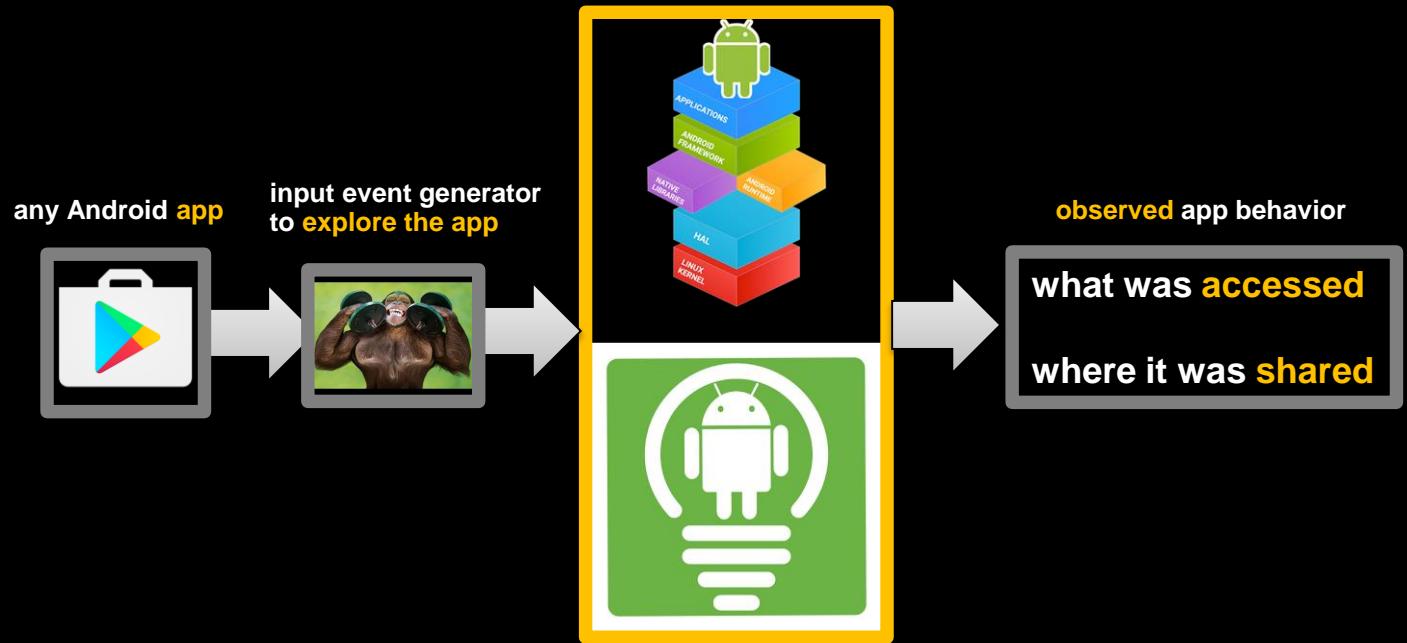
lumen app for network flow analysis



P. Wijesekera, A. Baokar, L. Tsai, J. Reardon, S. Egelman, D. Wagner, K. Beznosov, *The Feasibility of Dynamically Granted Permissions: Aligning Mobile Privacy with User Preferences*, IEEE Security and Privacy (Oakland) 2017

A. Razaghpanah, R. Nithyanand, N. Vallina Rodriguez, Srikanth Sundaresan, M. Allman, C. Kreibich, P. Gill, *Apps, Trackers, Privacy, and Regulators: A Global Study of the Mobile Tracking Ecosystem*, Network and Distributed System Security (NDSS) 2018

dynamic analysis environment



current deployment runs 1,000 apps/day

PERSONAL INFORMATION	PERSISTENT IDENTIFIERS
Owner Email Address	Hardware Serial Number
Phone Number	IMEI
GPS Latitude/Longitude	Wi-Fi MAC
Wi-Fi Router BSSID (MAC)	Android ID
Wi-Fi Router SSID (Name)	SIM Card ID
	Google Services Framework (GSF) ID
	Android Advertising ID (AAID)

Children's Online Privacy Protection Act COPPA

personal information

behavioral advertising X

verifiable parental consent ✓

reasonable security measures ✓

FINES UP TO 40K USD PER VIOLATION



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Two App Developers Settle FTC Charges They Violated Children's Online Privacy Protection Act

Companies' Apps **Shared Kids' Information with Ad Networks** Will Pay \$360K In Civil Penalties



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Mobile Advertising Network InMobi Settles FTC Charges It Tracked Hundreds of Millions of Consumers' Locations Without Permission

Company Will Pay \$950,000 For **Tracking Children Without Parental Consent**

My apps

Shop

Games

Family

Editors' Choice

Daydream

Art & Design

Auto & Vehicles

Beauty

Books & Reference

Business

Comics

Communication

Dating

Education

Games

Action

Adventure

Arcade

Board

Card

Casino

Casual

Educational

Music

Family

Ages 5 & Under

Ages 6-8

Ages 9 & Up

Action & Adventure

Brain Games

Creativity

Education

Music & Video

Pretend Play

Designed for Families











☐ Opt in to Designed for Families

Designed for Families is a developer program for apps and games designed specifically for children and family audiences. [Learn More](#)

5,855 free “Designed for Families” apps

57% of “Designed for Families” apps are in potential violation

POTENTIAL VIOLATION	RATE (n=5,855)
  Personal information	4.8%
  Non-resettable identifiers	39%
  Potentially non-compliant SDKs	19%
  Failure to take security measures	40%



4.8% collect **personal information**

WITHOUT VERIFIABLE PARENTAL CONSENT

START/APP

KOCHAVA★



skydec

4.4% collect fine **geolocation** data



AERSERV





Fun Kid Racing

Tiny Lab Racing Games Racing Action & Adventure ★★★★★ 79,028 

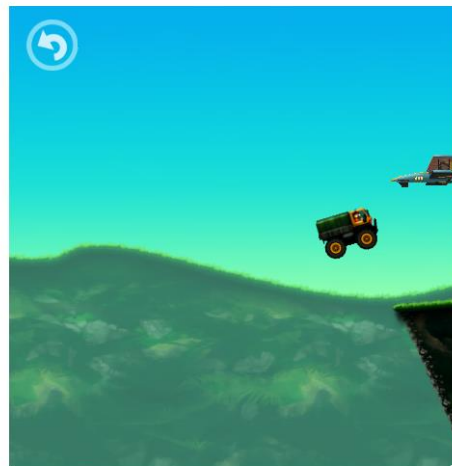
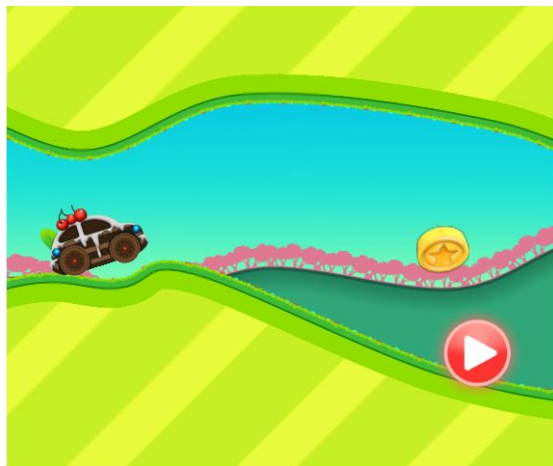
 Everyone

Contains Ads · Offers in-app purchases

 You don't have any devices.

 Add to Wishlist

Install





1.9% collect contact information

skydeo





Ads



Reset advertising ID

Opt out of Ads Personalization

Instruct apps not to use your advertising ID to build profiles or show you personalized ads.



Ads by Google

Enable debug logging for ads






Instruct apps to write ads debugging information (such as network traffic) to the system log.



Your advertising ID:
f98db6a4-4db2-4ff7-9f82-954f6105cb3f



39% share the AID along another identifier,
negating its privacy preserving benefits

AD PLATFORM	VIOLATION OF IDENTIFIER POLICY
Chartboost 	> 99%
	> 99%
	98%
...	...
mopub	3%
	2%
 DoubleClick by Google	1%

PROJECT OVERVIEW

This is a short project overview that contains information that you might need when working on your project.

Project details can be edited in Unity Connect, [click here to open it in a new tab](#).

Project ID: f8ede587-8091-48d5-aaff-986995bb4915

Coppa

☒ This game is directed to children under the age of 13 in the United States

[Learn more about COPPA](#)

50% **used Unity** (from DFF corpus of 5,855)

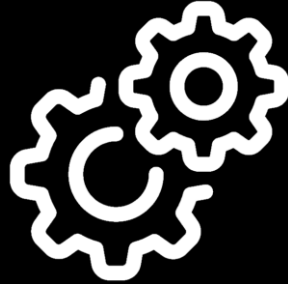
84% of Unity apps did **NOT** get coppaCompliant=true

not for children's apps












Developer further agrees it will not integrate the Software into any Application or Beta Application (i) with end users who Developer has actual knowledge are under the age of 13, or (ii) that may be deemed to be a “Web site or online service directed to children” as defined under the Children’s Online Privacy Protection Act of 1998 (“COPPA”) and the regulations promulgated thereunder.



19% share identifiers or personal information
with **SDKs not allowed in children's apps**

SDK	TOTAL DFF INSTALLS
 crashlytics	556M
 <i>supersonic</i> +  ironSource	481M
	386M
 mopub	296M
 INNERACTIVE	239M
 heyZap	150M



40% share identifiers and personal info
without using encrypted HTTP



Overall, **57%** of “Designed for Families” apps
are in potential violation



PRIVO[®]





Privacy & Permission = TRUST



INTEGRITY

Children's Advertising Review Unit[®]



	DFF (n=5,855)	SAFE HARBOR (n=237)
 SHARE PERSONAL INFO	4.8%	10%
 SHARE AAID + ANOTHER ID	39%	39%
 USE VERBOTEN SDK	19%	33%
 UNENCRYPTED HTTP	40%	49%




Rail Rush

Miniclip.com Arcade

★★★★★ 934,939

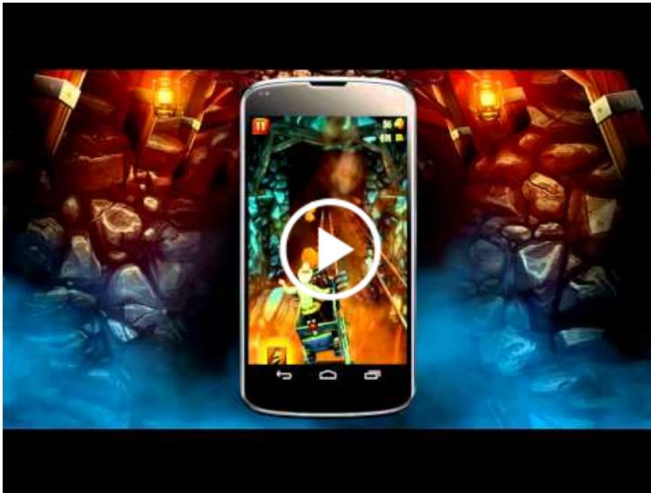
E Everyone

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 You don't have any devices.

 Add to Wishlist

Install



closing recommendations

developers: use compliant SDKs and options

SDK providers: enforce terms of use

platform providers: stricter security and analysis

Crashlytics

From Wikipedia, the free encyclopedia

Crashlytics is a Google-owned [Boston, Massachusetts](#)-based software company founded in May 2011 by entrepreneurs [Wayne Chang](#) and [Jeff Seibert](#).

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<https://appcensus.mobi>

<https://blog.appcensus.mobi>