



AppCensus

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1,000 Mobile Apps in Australia: Appendix C: Kids Apps

September 24, 2020



C Kids Apps

In this section, in contrast with the analysis in Section 4 that examined privacy trends across the three categories of apps, we present summary data about the specific apps within the Kids category. For these 100 apps, we present information about the data types transmitted by these apps during the testing period (Section C.1), which includes the most popular apps in this category that we detected transmitting these data types (Section C.1.4), and the most common recipients of this data (Section C.1.2). In Section C.2, we list the most frequently requested “dangerous” permissions by these apps,⁹⁶ as well as the most popular apps that requested them (in contrast with popular apps in this category that requested the fewest permissions). Finally, we list the most common SDKs identified within these apps (Section C.3),⁹⁷ including highlighting those that are most likely to collect user information (i.e., SDKs involved in analytics and advertising).

C.1 Data Types Transmitted

Apps in the Kids category were observed transmitting the data types listed in Table 31 during the testing period.⁹⁸

Data Type	# of Apps	(% of Apps)
AAID	47	(47.0%)
Android ID	46	(46.0%)
BT Name	13	(13.0%)
Email	2	(2.0%)
Name	2	(2.0%)
GPS Location	2	(2.0%)
Coarse Location	2	(2.0%)
BT BSSID	2	(2.0%)
IMEI	1	(1.0%)
WiFi MAC	1	(1.0%)
WiFi SSID	1	(1.0%)

Table 31: Data types transmitted by apps in the Kids category during the testing period.

⁹⁶For an explanation of dangerous permissions, see Section 4.3.

⁹⁷For an explanation of SDKs, see Section 4.1.2.

⁹⁸For an explanation of these data types, see Section 3.

C.1.1 Most Common Hostnames Contacted

Table 32 depicts the top 10 hostnames observed being contacted by Kids apps during the testing period, whereas Table 33 depicts the top 10 parent companies corresponding to these hostnames. This data reflects Internet servers that were *contacted* by apps, but does not necessarily mean that they received sensitive user information—we specifically discuss that subset of recipients in Section C.1.2.⁹⁹ The discrepancy between the two sections is due to the fact that some app transmissions may simply not contain sensitive user information or that its transmission was obfuscated using a method that we did not immediately recognize.

Hostname	Parent Company	# of Apps	(% of Apps)
config.uca.cloud.unity3d.com	Unity Technologies	27	(27.0%)
cdp.cloud.unity3d.com	Unity Technologies	24	(24.0%)
settings.crashlytics.com	Google	18	(18.0%)
googleads.g.doubleclick.net	Google	15	(15.0%)
graph.facebook.com	Facebook	13	(13.0%)
tpc.google syndication.com	Google	9	(9.0%)
fonts.googleapis.com	Google	9	(9.0%)
www.gstatic.com	Google	9	(9.0%)
fonts.gstatic.com	Google	8	(8.0%)
csi.gstatic.com	Google	8	(8.0%)

Table 32: The top 10 most common hostnames contacted by Kids apps during testing.

Company	# of Apps	(% of Apps)
Google	34	(34.0%)
Unity Technologies	29	(29.0%)
Facebook	13	(13.0%)
Oracle	7	(7.0%)
Microsoft	7	(7.0%)
Verizon	7	(7.0%)
Vungle	5	(5.0%)
AppLovin	5	(5.0%)
AppsFlyer	5	(5.0%)
KIDOZ	4	(4.0%)

Table 33: The top 10 most common companies contacted by Kids apps during testing.

⁹⁹We define “user information” in Section 3.

C.1.2 Most Common Data Recipients

Table 34 depicts the top 10 data recipients among the Kids apps during the testing period. Figure 32 depicts the approximate locations of these companies' Internet servers,¹⁰⁰ while Table 35 lists additional information about the most common data recipients during the testing period, such as the approximate locations of their servers, IP addresses contacted during testing, and the types of sensitive user information that we observed them receive.

Hostname	Parent Company	# of Apps	(% of Apps)
config.uca.cloud.unity3d.com	Unity Technologies	26	(26.0%)
cdp.cloud.unity3d.com	Unity Technologies	24	(24.0%)
graph.facebook.com	Facebook	13	(13.0%)
settings.crashlytics.com	Google	9	(9.0%)
ecommerce.iap.unity3d.com	Unity Technologies	8	(8.0%)
api.vungle.com	Vungle	5	(5.0%)
ads.api.vungle.com	Vungle	5	(5.0%)
data.flurry.com	Verizon	5	(5.0%)
publisher-config.unityads.unity3d.com	Unity Technologies	5	(5.0%)
auction.unityads.unity3d.com	Unity Technologies	5	(5.0%)

Table 34: The top 10 most common data recipients from Kids apps during testing.

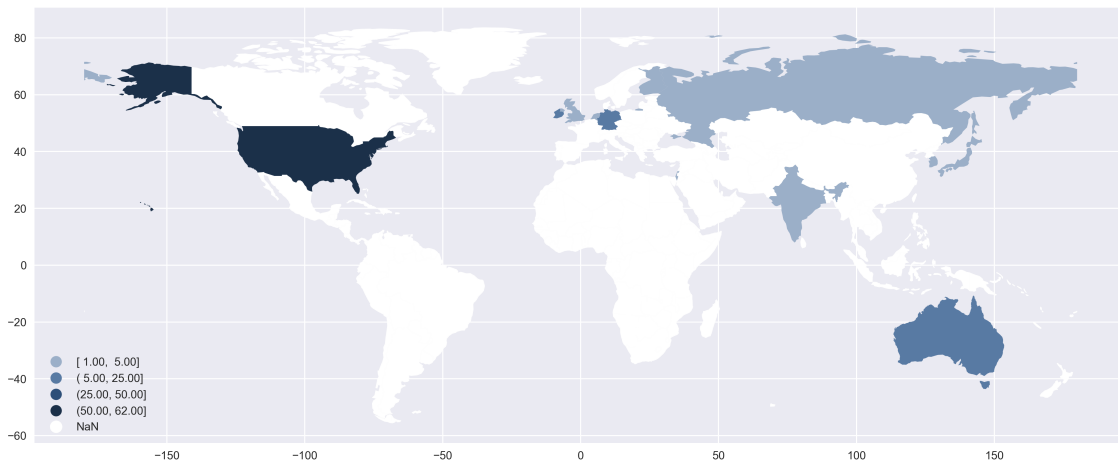


Figure 32: Percentage of Kids apps transmitting to different countries during testing.

¹⁰⁰As determined by geolIP lookups.

Table 35: The 10 most common recipient hostnames of user information from Kids apps during the testing period, along with their IP addresses, company information, and the data types that were observed being transmitted.

Parent Company	Country	IPs	Received Data
config.uca.cloud.unity3d.com			
Unity Technologies	United States	35.241.26.53 (US)	Android ID
cdp.cloud.unity3d.com			
Unity Technologies	United States	35.241.52.229	BT Name Android ID AAID
graph.facebook.com			
Facebook	United States	157.240.8.18 (US)	AAID
settings.crashlytics.com			
Google	United States	172.217.167.99 (US) 142.250.66.195 (US) 172.217.25.163 (US)	Android ID AAID
ecommerce.iap.unity3d.com			
Unity Technologies	United States	35.241.22.100 (US)	Android ID
ads.api.vungle.com			
Vungle	United States	104.68.1.109 (US)	GPS Location Android ID AAID Coarse Location
api.vungle.com			
Vungle	United States	104.68.1.109 (US)	GPS Location AAID Coarse Location
data.flurry.com			
Verizon	United States	115.178.9.19 (HK) 115.178.9.18 (HK)	Android ID AAID
publisher-config.unityads.unity3d.com			
Unity Technologies	United States	35.244.185.185 (US)	AAID
auction.unityads.unity3d.com			
Unity Technologies	United States	35.193.104.192 (US) 146.148.56.16 (US) 146.148.93.11 (US) 130.211.193.180 (US)	AAID

C.1.3 Apps Ranked by Number of Recipients

Table 36 ranks the Kids apps based on the number of recipients to which we detected each transmit sensitive user information during testing.

Table 36: Kids apps ordered by the number of recipients during the testing period (by unique hostnames and their parent companies).

App	Developer	Installs	Recipients	
			Hostnames	Companies
Be Closer Package Name: com.becloser Version: 2.4.1 (62)	Agromart Dev	10,000,000	14	9
Galaxy Attack: Alien Shooter (Premium) Package Name: com.alien.shooter.galaxy.attack.premium Version: 24.6 (28)	ONESOFT	100,000	15	7
Kids Top Nursery Rhymes Videos - Offline Learning Package Name: kidzooly.fivelittle Version: FiveLittle_v6.1 (422)	Kidzooly - Kids Games, Rhymes, Nursery Songs.	1,000,000	10	5
Monopoly - Board game classic about real-estate! Package Name: com.marmalade.monopoly Version: 1.1.4 (3442)	Marmalade Game Studio	100,000	7	5
Kindergarten Kids Learning: Fun Educational Games Package Name: com.greysprings.kindergarten8 Version: 6.3.4.2 (821246342)	Greysprings	1,000,000	6	4
Toca Blocks Package Name: com.tocaboca.blocks Version: 1.2.1-play (4780)	Toca Boca	100,000	5	4
Toca Lab: Plants Package Name: com.tocaboca.tocalabplants Version: 1.1.1 (4387)	Toca Boca	50,000	5	4
Educational Puzzles for Kids (Preschool) Package Name: forqan.tech.babypuzzles_edu.ads Version: 1.4.8 (48)	KIDEO (formerly forqan smart tech)	1,000,000	6	3
ABC Song - Rhymes Videos, Games, Phonics Learning Package Name: kidzooly.rhymes Version: 3.57 (358)	Kidzooly - Kids Games, Rhymes, Nursery Songs.	1,000,000	3	3
Farm and Click - Idle Farming Clicker PRO Package Name: com.farm.pro.clicker Version: 1.2.2 (22)	Red Machine	500,000	6	3
Vector Full Package Name: com.nekki.vector.paid Version: 1.2.0 (5000101)	NEKKI	500,000	7	3

(Table Continues)

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Spriggy Pocket Money Package Name: au.com.spriggy.app Version: 1.11.0 (779)	Spriggy	100,000	3	3
Carcassonne: Official Board Game -Tiles & Tactics Package Name: com.asmodeedigital.carcassonne Version: 1.8 (2921)	Asmodee Digital	100,000	5	3
My Little Princess : Castle Package Name: mylittleprincess.castle Version: 1.18 (27)	My Town Games Ltd	100,000	7	3
Assassin Lord : Idle RPG (BUFF) Package Name: com.honeydew.heroassassin2vipb Version: 1.0.34 (22)	Honeydew Games	10,000	8	3
Minecraft Package Name: com.mojang.minecraftpe Version: 1.14.60.5 (943146005)	Mojang	10,000,000	2	2
Seesaw Class Package Name: seesaw.shadowpuppet.co.classroom Version: 7.0.8 (1612102)	Seesaw Learning	1,000,000	2	2
Star Wars™ Pinball 7 Package Name: com.zenstudios.StarWarsPinball Version: 7.0 (23)	Zen Studios	1,000,000	2	2
Overdrive Premium Package Name: com.gsm.overdrivepremium Version: 1.8.1 (1810)	GEMMOB Adventure	1,000,000	6	2
Sky Dancer Premium Package Name: topebox.game.skydancer.premium Version: 4.2.7 (428)	TOPEBOX	1,000,000	4	2
Ski Safari Package Name: com.DefiantDev.SkiSafari Version: 1.5.4 (19)	Defiant Development	500,000	2	2
Dr. Panda's Swimming Pool Package Name: com.tribeplay.swimmingpool Version: 1.01 (5)	Dr. Panda	100,000	2	2
Audio Books for Kids Package Name: com.AudioFairytales Version: 5.6 (1299)	BestProjects	100,000	6	2
Traffix Package Name: com.infinity.traffix Version: 6.0 (50)	InfinityGames.io	100,000	3	2
Tokaido™ Package Name: com.funforgedigital.tokaido	Funforge Digital	100,000	3	2

(Table Continues)

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Version: 1.16.4 (94) Fieldrunners 2 Package Name: com.subatomicstudios.fieldrunners2 Version: 1.8 (18)	Subatomic Studios, LLC	100,000	2	2
RollerCoaster Tycoon® Classic Package Name: com.atari.mobile.rctclassic Version: 1.0.0.1903060 (5)	Atari, Inc.	50,000	2	2
Kids Learn About Animals Package Name: net.cleverbit.LearnAnimalsEx Version: 8.1 (200810)	CLEVERBIT	50,000	5	2
Rush Rally 3 Package Name: brownmonster.app.game.rushrally3 Version: 1.86 (86)	Brownmonster Limited	10,000	2	2
Pinkfong Baby Shark Package Name: kr.co.smartstudy.babyshark_android_googlemarket Version: 25 (2500)	SMARTSTUDY PINKFONG	10,000,000	2	1
ClassDojo Package Name: com.classdojo.android Version: 4.87.1 (210048701)	ClassDojo	10,000,000	2	1
Mathway Package Name: com.bagatrix.mathway.android Version: 3.3.20 (243)	Mathway	10,000,000	1	1
Canvas Student Package Name: com.instructure.candroid Version: 6.7.0 (208)	Instructure	5,000,000	1	1
Worms 3 Package Name: com.worms3.app Version: 2.06 (62)	Team 17 Digital Limited	1,000,000	1	1
Dr. Panda Town: Collection Package Name: com.drpanda.town.street Version: 20.2.21 (202210929)	Dr. Panda	1,000,000	2	1
Poly Bridge Package Name: com.drycactus.polybridge Version: 1.2.2 (7)	Dry Cactus Limited	100,000	2	1
Compass School Manager Package Name: com.jdlf.compass Version: 3.4.3 (218)	Compass Education	100,000	1	1
SkoolBag: School Communication Package Name: com.skoolbag.singleapp Version: 6.2.3 (276)	Skoolbag	100,000	1	1
Reading Eggs - Learn to Read	Blake eLearning Pty Ltd (Table Continues)	100,000	1	1

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Package Name: com.blake.readingeggs.android Version: v1.4.0+35 (35)				
Mobile Zone for Child Devices Package Name: au.com.familyzone Version: 2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000	3	1
Splendor Package Name: com.daysofwonder.Splendor.gp Version: 2.4.0 (841)	Asmodee Digital	100,000	1	1
Dr. Panda Airport Package Name: com.tribeplay.pandaairport Version: 19.1.85 (191851425)	Dr. Panda	100,000	2	1
LEGO® Star Wars™: TCS Package Name: com.wb.lego.tcs Version: 1.8.60 (1063)	Warner Bros. International Enterprises	100,000	1	1
Youtubers Life: Gaming Channel Package Name: com.uplayonline.youtubers Version: 1.5.9 (310552)	U-Play Online	100,000	2	1
Marvel Pinball Package Name: com.zenstudios.MarvelPinball Version: 1.8.1 (22)	Zen Studios	100,000	1	1
Dr. Panda Restaurant 2 Package Name: com.tribeplay.pandarestaurant2 Version: 1.96 (30)	Dr. Panda	100,000	1	1
Teen Titans GO Figure! Package Name: com.turner.ttgfigures2 Version: 1.1.8 (197)	Cartoon Network	100,000	2	1
Toca Boo Package Name: com.tocaboca.tocaboo Version: 1.0.1-play (2823)	Toca Boca	100,000	1	1
Idle Train Station Tycoon : Money Clicker Inc. Package Name: com.medu.Idle.Train.Station.Tycoon.Money.Clicker Version: 1.2.2 (22)	MEDU	100,000	3	1
Hoopa City 2 Package Name: com.drpanda.city2 Version: 19.1.87 (191871025)	Dr. Panda	50,000	2	1
BRIO World - Railway Package Name: se.filimundus.briorailway Version: 4.0.3 (403)	Filimundus AB	50,000	3	1
Dr. Panda Train Package Name: com.drpanda.train Version: 1.02 (3)	Dr. Panda	50,000	2	1

(Table Continues)

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Zoombinis Package Name: edu.terc.zoombinis Version: 1.0.12 (15)	TERC	10,000	2	1
MathLand Full Version: Mental Math Games for kids Package Name: com.EducaGames.MathLandFull Version: 1.95 (195)	Didactoons	10,000	2	1
Reading Raven: Learn to read phonics adventure Package Name: com.readingraven.android Version: 1.08 (1008)	Early Ascent LLC	10,000	2	1
Monster Numbers Full Version: Math games for kids Package Name: com.playtic.monsternumbersFull Version: 8.53 (853)	Didactoons	10,000	2	1
SPACE INVADERS Package Name: jp.co.taito.am.spaceinvaders Version: 1.3.0 (7)	TAITO Corporation	10,000	2	1
Bing: Baking Game Package Name: com.acamar.bingbaking Version: 1.3.2 (10302)	Acamar Films	10,000	4	1
Mega Mall Story2 Package Name: net.kairosoft.android.depart2 Version: 1.1.7 (18)	Kairosoft Co.,Ltd	10,000	2	1
Google Classroom Package Name: com.google.android.apps.classroom Version: 6.4.181.03.40 (201810340)	Google LLC	50,000,000	0	0
Bridge Constructor Package Name: com.headupgames.bridgeconstructor Version: 8.2 (802416)	ClockStone STUDIO	1,000,000	0	0
Geometry Dash Package Name: com.robtopx.geometryjump Version: 2.111 (33)	RobTop Games	1,000,000	0	0
Mini Metro Package Name: nz.co.codepoint.minimetro Version: 2.41.0 (69)	Dinosaur Polo Club	1,000,000	0	0
Teach Your Monster to Read: Phonics & Reading Game Package Name: com.teachyourmonstertoread.tmapp Version: 4.0.5 (5260)	Teach Monster Games Limited	500,000	0	0
Catan Classic Package Name: com.exozet.android.catan Version: 4.7.4 (47400)	USM	500,000	0	0
The Game of Life Package Name: com.marmalade.golmobile	Marmalade Game Studio	500,000	0	0

(Table Continues)

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Version: 2.2.7 (2002007) Animal Forest : Fuzzy Seasons (Start Pack Edition) Package Name: com.fathermade.animalgarden_se Version: 189 (189)	FatherMade	500,000	0	0
Mathletics Students Package Name: com.mathletics Version: 3.7.0 (22030700)	3P Learning Ltd	100,000	0	0
Ticket to Ride Package Name: com.daysofwonder.tt.android Version: 2.7.5-6612-f1f9f99e (6612)	Asmodee Digital	100,000	0	0
Speed Math 2018 - Pro Package Name: com.eggies.speedmathpaid Version: 0.9 (900)	Eggies	100,000	0	0
Math Workout - Math Games Package Name: io.ts.mathworkout Version: 2.6 (20600)	FitMind	100,000	0	0
Chess Package Name: uk.co.aifactory.chess Version: 3.25 (156)	AI Factory Limited	100,000	0	0
Dr. Panda & Toto's Treehouse Package Name: com.tribeplay.pandapet Version: 1.8 (18)	Dr. Panda	100,000	0	0
LEGO® Jurassic World™ Package Name: com.wb.goog.legojurassicworld Version: 2.0.1.18 (20118)	Warner Bros. International Enterprises	100,000	0	0
PAW Patrol Pups to the Rescue Package Name: com.seven2.pawapp2 Version: 1.4 (248)	Nickelodeon	100,000	0	0
Survivalcraft 2 Package Name: com.candyrufusgames.survivalcraft2 Version: 2.2.10.4 (42021004)	Candy Rufus Games	100,000	0	0
Pocket City Package Name: com.codebrewgames.pocketcitygame Version: 1.1.348 (10448)	Codebrew Games	100,000	0	0
Townsmen Premium Package Name: com.hg.townsmen7 Version: 1.14.3 (79)	HandyGames	100,000	0	0
Dr. Panda Restaurant Package Name: com.tribeplay.pandarestaurant Version: 2.4 (24)	Dr. Panda	100,000	0	0
Rescue the Enchanter	Syntaxity (Table Continues)	100,000	0	0

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Package Name: com.lonewolfgames.rescueenchanter Version: 2.9 (29)				
LEGO @ Marvel Super Heroes Package Name: com.wb.lego.marvel Version: 2.0.1.12 (20112)	Warner Bros. International Enterprises	100,000	0	0
Pandemic: The Board Game Package Name: com.f2zentertainment.pandemic Version: 2.2.6-60004084-400ce9c1 (60004084)	Asmodee Digital	100,000	0	0
Talisman Package Name: com.nomadgames.talisman Version: 28.00 (280000000)	Nomad Games	100,000	0	0
Gem Miner 2 Package Name: au.com.phil.mine2 Version: 1.6.4 (47)	Psym Mobile	100,000	0	0
Dr. Panda School Package Name: com.drpanda.school Version: 1.2 (4)	Dr. Panda	100,000	0	0
My PlayHome : Play Home Doll House Package Name: com.playhome Version: 3.6.2.24 (1527105011)	Shimon Young : Play Home Software	100,000	0	0
Jet Car Stunts Package Name: com.trueaxis.jetcarstunts Version: 1.08 (9)	True Axis	50,000	0	0
Peppa Pig: Holiday Package Name: com.peppapig.holiday Version: 1.2.6 (25)	Entertainment One	50,000	0	0
Jazza's Arty Games Package Name: com.JazzaStudios.JazzasArtyGames Version: 2.1.0 (210)	Jazza Studios	50,000	0	0
Dr. Panda Firefighters Package Name: com.tribeplay.pandafirestation Version: 1.0 (4)	Dr. Panda	50,000	0	0
My PlayHome School Package Name: com.playhome.school Version: 3.6.3.24 (1527105012)	Shimon Young : Play Home Software	50,000	0	0
Dr. Panda Racers Package Name: com.drpanda.racers Version: 1.0 (2)	Dr. Panda	50,000	0	0
SimpleRockets 2 Package Name: com.jundroo.SimpleRockets2 Version: 0.9.307 (30)	Jundroo, LLC	10,000	0	0

(Table Continues)

Table 36 (Continued)

App	Developer	Installs	Recipients	
			Hostnames	Companies
Hey Duggee: The Big Badge App Package Name: com.bbc.heyduggeebigbadgeapp Version: 1.7 (155)	BBC Worldwide (Ltd)	10,000	0	0
Layton: Curious Village in HD Package Name: com.Level5.LT1REU Version: 1.0.3 (32)	LEVEL-5 Inc.	10,000	0	0
On Tour Board Game Package Name: com.boardgametables.ontour Version: 0.12.6 (1206)	BoardGameTables.com	10,000	0	0
One Deck Dungeon Package Name: com.handelabra.OneDeckDungeon Version: 1.4.5 (193)	Handelabra Games	10,000	0	0
Gruffalo: Games Package Name: air.com.magiclightpictures.gruffalogamesAndroid Version: 1.1.1 (1001001)	Magic Light Pictures	10,000	0	0
Crocro Adventure Package Name: com.sec.kidsplat.kidsbcg Version: 10.0.17 (1001700000)	SiDi	5,000	0	0
Classic Sudoku Package Name: com.StudioGoya.ClassicSudoku Version: 1.06 (7)	Studio Goya LLC	5,000	0	0

C.1.4 Popular Apps Transmitting Each Data Type

For each of these data types, Table 37 lists the top 5 most popular Kids apps that we observed transmitting them during testing.¹⁰¹

Table 37: The top 5 Kids apps that we detected transmitting each data type during the testing period.

Data Type	Top 5 Apps	Developer	# of Installs
AAID			
	Pinkfong Baby Shark (kr.co.smartstudy.babyshark_android_googlemarket), v25 (2500)	SMARTSTUDY PINKFONG	10,000,000
	Mathway (com.bagatrix.mathway.android), v3.3.20 (243)	Mathway	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Educational Puzzles for Kids (Preschool) (forqan.tech.babypuzzles_edu.ads), v1.4.8 (48)	KIDEO (formerly forqan smart tech)	1,000,000
Android ID			
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000
BT Name			
	Overdrive Premium (com.gsm.overdrivepremium), v1.8.1 (1810)	GEMMOB Adventure	1,000,000
	Sky Dancer Premium (topebox.game.skydancer.premium), v4.2.7 (428)	TOPEBOX	1,000,000
	Monopoly - Board game classic about real-estate! (com.marmalade.monopoly), v1.1.4 (3442)	Marmalade Game Studio	100,000
	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000

(Table Continues)

¹⁰¹ Popularity is determined by the number of reported installs in the Google Play Store.

Table 37 (Continued)

Data Type	Top 5 Apps	Developer	# of Installs
	Traffix (com.infinity.traffix), v6.0 (50)	InfinityGames.io	100,000
Email	Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000
	Star Wars™ Pinball 7 (com.zenstudios.StarWarsPinball), v7.0 (23)	Zen Studios	1,000,000
Name	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000
GPS Location	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000
Coarse Location	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000
BT BSSID	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Kids Top Nursery Rhymes Videos - Offline Learning (kidzooly.fivelittle), vFiveLittle_v6.1 (422)	Kidzooly - Kids Games, Rhymes , Nursery Songs.	1,000,000
IMEI	Dr. Panda's Swimming Pool (com.tribeplay.swimmingpool), v1.01 (5)	Dr. Panda	100,000
WiFi MAC	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000
WiFi SSID	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000

Table 38 lists the 5 most popular Kids apps that transmitted the most data types during the testing period, whereas Table 39 lists the 5 most popular Kids apps that transmitted the fewest data types during the testing period.

Top 5 Apps	Developer	# of Installs	Data Types
Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000	6
Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000	5
Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000	4
Star Wars™ Pinball 7 (com.zenstudios.StarWarsPinball), v7.0 (23)	Zen Studios	1,000,000	3
Overdrive Premium (com.gsm.overdrivepremium), v1.8.1 (1810)	GEMMOB Adventure	1,000,000	3

Table 38: The top 5 Kids apps that transmitted the most data types during testing.

Top 5 Apps	Developer	# of Installs	Data Types
Google Classroom (com.google.android.apps.classroom), v6.4.181.03.40 (201810340)	Google LLC	50,000,000	0
Bridge Constructor (com.headupgames.bridgeconstructor), v8.2 (802416)	ClockStone STUDIO	1,000,000	0
Geometry Dash (com.robtopx.geometryjump), v2.111 (33)	RobTop Games	1,000,000	0
Mini Metro (nz.co.codepoint.minimetro), v2.41.0 (69)	Dinosaur Polo Club	1,000,000	0
Teach Your Monster to Read: Phonics & Reading Game (com.teachyourmonstertoread.tmapp), v4.0.5 (5260)	Teach Monster Games Limited	500,000	0

Table 39: The top 5 Kids apps that transmitted the fewest data types during testing.

C.2 App Permissions

Apps in the Kids category requested the dangerous permissions listed in Table 40.¹⁰²

Data Type	# of Apps	(% of Apps)
WRITE_EXTERNAL_STORAGE	67	(67.0%)
READ_EXTERNAL_STORAGE	41	(41.0%)
READ_PHONE_STATE	16	(16.0%)
CAMERA	12	(12.0%)
RECORD_AUDIO	8	(8.0%)
GET_ACCOUNTS	8	(8.0%)
ACCESS_COARSE_LOCATION	5	(5.0%)
ACCESS_FINE_LOCATION	5	(5.0%)
READ_CONTACTS	4	(4.0%)
WRITE_CALENDAR	1	(1.0%)
READ_CALENDAR	1	(1.0%)
ACCESS_BACKGROUND_LOCATION	1	(1.0%)

Table 40: Dangerous permissions requested by apps in the Kids category.

¹⁰²For an explanation of dangerous permissions, see Section 4.3.

C.2.1 Popular Apps Requesting Dangerous Permissions

For each of these permissions, Table 41 lists the top 5 most popular apps that we observed requesting dangerous permissions during testing.¹⁰³

Table 41: The 5 most popular Kids apps that requested each dangerous permission.

Permission	Top 5 Apps	Developer	# of Installs
WRITE_EXTERNAL_STORAGE			
	Google Classroom (com.google.android.apps.classroom), (201810340)	v6.4.181.03.40 Google LLC	50,000,000
	Pinkfong Baby Shark (kr.co.smartstudy.babyspark_android_googlemarket), (2500)	v25 SMARTSTUDY PINKFONG	10,000,000
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	10,000,000
	Mathway (com.bagatrix.mathway.android), v3.3.20 (243)	Mathway	10,000,000
READ_EXTERNAL_STORAGE			
	Pinkfong Baby Shark (kr.co.smartstudy.babyspark_android_googlemarket), (2500)	v25 SMARTSTUDY PINKFONG	10,000,000
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Educational Puzzles for Kids (Preschool) (forqan.tech.babypuzzles_edu.ads), v1.4.8 (48)	KIDEO (formerly forqan smart tech)	1,000,000
READ_PHONE_STATE			
	Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Worms 3 (com.worms3.app), v2.06 (62)	Team 17 Digital Limited	1,000,000
	Geometry Dash (com.robtopx.geometryjump), v2.111 (33)	RobTop Games	1,000,000

(Table Continues)

¹⁰³Popularity is determined by the number of reported installs in the Google Play Store.

Table 41 (Continued)

Permission	Top 5 Apps	Developer	# of Installs
	Vector Full (com.nekki.vector.paid), v1.2.0 (5000101)	NEKKI	500,000
CAMERA			
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Mathway (com.bagatrix.mathway.android), v3.3.20 (243)	Mathway	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000
RECORD_AUDIO			
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	1,000,000
	Dr. Panda Town: Collection (com.drpanda.town.street), v20.2.21 (202210929)	Dr. Panda	1,000,000
	SkoolBag: School Communication (com.skoolbag.singleapp), v6.2.3 (276)	Skoolbag	100,000
GET_ACCOUNTS			
	Google Classroom (com.google.android.apps.classroom), v6.4.181.03.40 (201810340)	Google LLC	50,000,000
	Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	10,000,000
	Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000
	Worms 3 (com.worms3.app), v2.06 (62)	Team 17 Digital Limited	1,000,000
	Ticket to Ride (com.daysofwonder.tt.android), v2.7.5-6612-f1f9f99e (6612)	Asmodee Digital	100,000
ACCESS_COARSE_LOCATION			
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Be Closer	Agromart Dev	10,000,000

(Table Continues)

Table 41 (Continued)

Permission	Top 5 Apps	Developer	# of Installs
	(com.becloser), v2.4.1 (62)		
	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000
	Ticket to Ride (com.daysofwonder.tf.android), v2.7.5-6612-f1f9f99e (6612)	Asmodee Digital	100,000
	Pandemic: The Board Game (com.f2zentertainment.pandemic), v2.2.6-60004084-400ce9c1 (60004084)	Asmodee Digital	100,000
ACCESS_FINE_LOCATION			
	ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000
	Ticket to Ride (com.daysofwonder.tf.android), v2.7.5-6612-f1f9f99e (6612)	Asmodee Digital	100,000
	Pandemic: The Board Game (com.f2zentertainment.pandemic), v2.2.6-60004084-400ce9c1 (60004084)	Asmodee Digital	100,000
READ_CONTACTS			
	Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	10,000,000
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000
	Worms 3 (com.worms3.app), v2.06 (62)	Team 17 Digital Limited	1,000,000
	Spriggy Pocket Money (au.com.spriggy.app), v1.11.0 (779)	Spriggy	100,000
WRITE_CALENDAR			
	SkoolBag: School Communication (com.skoolbag.singleapp), v6.2.3 (276)	Skoolbag	100,000
READ_CALENDAR			
	SkoolBag: School Communication (com.skoolbag.singleapp), v6.2.3 (276)	Skoolbag	100,000
ACCESS_BACKGROUND_LOCATION			
	Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000

Table 42 lists the 5 most popular Kids apps that requested the most permissions, whereas Table 43 lists the 5 most popular Kids apps that requested the fewest permissions.

Top 5 Apps	Developer	# of Installs	Permissions
Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	10,000,000	23
Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	100,000	22
SkoolBag: School Communication (com.skoolbag.singleapp), v6.2.3 (276)	Skoolbag	100,000	13
ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	10,000,000	12
Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	5,000,000	12

Table 42: The 5 most popular Kids apps that requested the most permissions.

Top 5 Apps	Developer	# of Installs	Permissions
Classic Sudoku (com.StudioGoya.ClassicSudoku), v1.06 (7)	Studio Goya LLC	5,000	0
Pocket City (com.codebrewgames.pocketcitygame), v1.1.348 (10448)	Codebrew Games	100,000	1
Jet Car Stunts (com.trueaxis.jetcarstunts), v1.08 (9)	True Axis	50,000	1
MathLand Full Version: Mental Math Games for kids (com.EducaGames.MathLandFull), v1.95 (195)	Didactoons	10,000	1
Monster Numbers Full Version: Math games for kids (com.playtic.monsternumbersFull), v8.53 (853)	Didactoons	10,000	1

Table 43: The 5 most popular Kids apps that requested the least number of permissions.

C.2.2 Permission Usage

While the previous subsection depicted the dangerous permissions *requested* by the apps that were tested, Table 44 lists the Kids apps based on the dangerous permissions that were observed being *used* during the testing period.

Table 44: Kids apps based on total number of permissions requested, the number of those that are considered “dangerous,” and the percentage of those dangerous permissions that were used during testing.

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Be Closer (com.becloser), v2.4.1 (62)	Agromart Dev	23	8	50.0
Mobile Zone for Child Devices (au.com.familyzone), v2.5.2 (261)	FAMILY ZONE CYBER SAFETY LIMITED	22	6	16.7
SkoolBag: School Communication (com.skoolbag.singleapp), v6.2.3 (276)	Skoolbag	13	6	0.0
Compass School Manager (com.jdlf.compass), v3.4.3 (218)	Compass Education	12	3	0.0
Canvas Student (com.instructure.candroid), v6.7.0 (208)	Instructure	12	5	0.0
ClassDojo (com.classdojo.android), v4.87.1 (210048701)	ClassDojo	12	6	33.3
Ticket to Ride (com.daysofwonder.tt.android), v2.7.5-6612-f1f9f99e (6612)	Asmodee Digital	11	6	0.0
The Game of Life (com.marmalade.golmobile), v2.2.7 (2002007)	Marmalade Game Studio	11	2	0.0
Seesaw Class (seesaw.shadowpuppet.co.classroom), v7.0.8 (1612102)	Seesaw Learning	11	4	25.0
Spriggy Pocket Money (au.com.spriggy.app), v1.11.0 (779)	Spriggy	10	4	0.0
Google Classroom (com.google.android.apps.classroom), v6.4.181.03.40 (201810340)	Google LLC	10	2	0.0
Monopoly - Board game classic about real-estate! (com.marmalade.monopoly), v1.1.4 (3442)	Marmalade Game Studio	10	3	0.0
Mathletics Students (com.mathletics), v3.7.0 (22030700)	3P Learning Ltd	10	4	0.0
Worms 3 (com.worms3.app), v2.06 (62)	Team 17 Digital Limited	10	4	25.0

(Table Continues)

Table 44 (Continued)

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Splendor (com.daysof.wonder.Splendor.gp), v2.4.0 (841)	Asmodee Digital	9	2	0.0
Dr. Panda Town: Collection (com.dr.panda.town.street), v20.2.21 (202210929)	Dr. Panda	9	3	0.0
Vector Full (com.nekki.vector.paid), v1.2.0 (5000101)	NEKKI	9	2	0.0
Kids Top Nursery Rhymes Videos - Offline Learning (kidzooly.fivelittle), vFiveLittle_v6.1 (422)	Kidzooly - Kids Games, Rhymes , Nursery Songs.	8	2	0.0
LEGO® Jurassic World™ (com.wb.goog.legojurassicworld), v2.0.1.18 (20118)	Warner Bros. International Enterprises	8	4	0.0
LEGO® Marvel Super Heroes (com.wb.lego.marvel), v2.0.1.12 (20112)	Warner Bros. International Enterprises	8	4	0.0
Poly Bridge (com.drycactus.polybridge), v1.2.2 (7)	Dry Cactus Limited	7	2	0.0
ABC Song - Rhymes Videos, Games, Phonics Learning (kidzooly.rhymes), v3.57 (358)	Kidzooly - Kids Games, Rhymes , Nursery Songs.	7	2	0.0
Minecraft (com.mojang.minecraftpe), v1.14.60.5 (943146005)	Mojang	7	4	0.0
Audio Books for Kids (com.AudioFairytale), v5.6 (1299)	BestProjects	7	1	0.0
LEGO® Star Wars™: TCS (com.wb.lego.tcs), v1.8.60 (1063)	Warner Bros. International Enterprises	7	2	0.0
Hey Duggee: The Big Badge App (com.bbc.heyduggeebigbadgeapp), v1.7 (155)	BBC Worldwide (Ltd)	7	3	0.0
Reading Raven: Learn to read phonics adventure (com.readingraven.android), v1.08 (1008)	Early Ascent LLC	7	3	0.0
Tokaido™ (com.funforgedigital.tokaido), v1.16.4 (94)	Funforge Digital	7	1	0.0
RollerCoaster Tycoon® Classic (com.atari.mobile.rctclassic), v1.0.0.1903060 (5)	Atari, Inc.	7	3	0.0
Pandemic: The Board Game (com.f2zentertainment.pandemic), v2.2.6-60004084- 400ce9c1 (60004084)	Asmodee Digital	7	4	0.0
Animal Forest : Fuzzy Seasons (Start Pack Edition) (com.fathermade.animalgarden_se), v189 (189)	FatherMade	7	2	0.0
Teen Titans GO Figure! (com.turner.ftgfigures2), v1.1.8 (197)	Cartoon Network	7	2	0.0
Gem Miner 2 (au.com.phil.mine2), v1.6.4 (47)	Psym Mobile	7	2	0.0

(Table Continues)

Table 44 (Continued)

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Kindergarten Kids Learning: Fun Educational Games (com.greysprings.kindergarten8), v6.3.4.2 (821246342)	Greysprings	7	2	0.0
Educational Puzzles for Kids (Preschool) (forqan.tech.babypuzzles_edu.ads), v1.4.8 (48)	KiDEO (formerly forqan smart tech)	6	2	0.0
Pinkfong Baby Shark (kr.co.smartstudy.babyshark_android_googlemarket), (2500)	v25 SMARTSTUDY PINKFONG	6	2	0.0
Catan Classic (com.exozet.android.catan), v4.7.4 (47400)	USM	6	2	0.0
Youtubers Life: Gaming Channel (com.uplayonline.youtubers), v1.5.9 (310552)	U-Play Online	6	2	0.0
Layton: Curious Village in HD (com.Level5.LT1REU), v1.0.3 (32)	LEVEL-5 Inc.	6	2	0.0
On Tour Board Game (com.boardgametables.ontour), v0.12.6 (1206)	BoardGameTables.com	6	1	0.0
Fieldrunners 2 (com.subatomicstudios.fieldrunners2), v1.8 (18)	Subatomic Studios, LLC	6	1	0.0
Hoopa City 2 (com.drpanda.city2), v19.1.87 (191871025)	Dr. Panda	6	2	0.0
Dr. Panda Restaurant (com.tribeplay.pandarestaurant), v2.4 (24)	Dr. Panda	6	2	0.0
My Little Princess : Castle (mylittleprincess.castle), v1.18 (27)	My Town Games Ltd	6	2	0.0
One Deck Dungeon (com.handelabra.OneDeckDungeon), v1.4.5 (193)	Handelabra Games	6	2	0.0
Bing: Baking Game (com.acamar.bingbaking), v1.3.2 (10302)	Acamar Films	6	2	0.0
Dr. Panda's Swimming Pool (com.tribeplay.swimmingpool), v1.01 (5)	Dr. Panda	6	2	50.0
Mathway (com.bagatrix.mathway.android), v3.3.20 (243)	Mathway	6	2	50.0
Dr. Panda & Toto's Treehouse (com.tribeplay.pandapet), v1.8 (18)	Dr. Panda	6	2	50.0
Farm and Click - Idle Farming Clicker PRO (com.farm.pro.clicker), v1.2.2 (22)	Red Machine	5	2	0.0
Toca Blocks (com.tocaboca.blocks), v1.2.1-play (4780)	Toca Boca	5	1	0.0
Toca Lab: Plants (com.tocaboca.tocalabplants), v1.1.1 (4387)	Toca Boca	5	1	0.0

(Table Continues)

Table 44 (Continued)

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Star Wars™ Pinball 7 (com.zenstudios.StarWarsPinball), v7.0 (23)	Zen Studios	5	1	0.0
Speed Math 2018 - Pro (com.eggies.speedmathpaid), v0.9 (900)	Eggies	5	2	0.0
Math Workout - Math Games (io.ts.mathworkout), v2.6 (20600)	FitMind	5	1	0.0
PAW Patrol Pups to the Rescue (com.seven2.pawapp2), v1.4 (248)	Nickelodeon	5	1	0.0
Assassin Lord : Idle RPG (BUFF) (com.honeydew.heroassassin2vipb), v1.0.34 (22)	Honeydew Games	5	0	0.0
Townsmen Premium (com.hg.townsmen7), v1.14.3 (79)	HandyGames	5	2	0.0
Jazza's Arty Games (com.JazzaStudios.JazzasArtyGames), v2.1.0 (210)	Jazza Studios	5	1	0.0
Toca Boo (com.tocaboca.tocaboo), v1.0.1-play (2823)	Toca Boca	5	1	0.0
Geometry Dash (com.robtopx.geometryjump), v2.111 (33)	RobTop Games	5	2	50.0
Teach Your Monster to Read: Phonics & Reading Game (com.teachyourmonstertoread.tmapp), v4.0.5 (5260)	Teach Monster Games Limited	4	0	0.0
Reading Eggs - Learn to Read (com.blake.readingeggs.android), vv1.4.0+35 (35)	Blake eLearning Pty Ltd	4	1	0.0
Galaxy Attack: Alien Shooter (Premium) (com.alien.shooter.galaxy.attack.premium), v24.6 (28)	ONESOFT	4	0	0.0
Chess (uk.co.aifactory.chess), v3.25 (156)	AI Factory Limited	4	1	0.0
Ski Safari (com.DefiantDev.SkiSafari), v1.5.4 (19)	Defiant Development	4	2	0.0
Survivalcraft 2 (com.candyrufusgames.survivalcraft2), v2.2.10.4 (42021004)	Candy Rufus Games	4	1	0.0
Marvel Pinball (com.zenstudios.MarvelPinball), v1.8.1 (22)	Zen Studios	4	1	0.0
Sky Dancer Premium (topebox.game.skydancer.premium), v4.2.7 (428)	TOPEBOX	4	0	0.0
Idle Train Station Tycoon : Money Clicker Inc. (com.medu.Idle.Train.Station.Tycoon.Money.Clicker), v1.2.2 (22)	MEDU	4	0	0.0
Kids Learn About Animals (net.cleverbit.LearnAnimalsEx), v8.1 (200810)	CLEVERBIT	4	0	0.0

(Table Continues)

Table 44 (Continued)

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Mega Mall Story2 (net.kairosoft.android.depart2), v1.1.7 (18)	Kairosoft Co.,Ltd	4	1	0.0
My PlayHome School (com.playhome.school), v3.6.3.24 (1527105012)	Shimon Young : Play Home Software	4	1	100.0
Carcassonne: Official Board Game -Tiles & Tactics (com.asmodeedigital.carcassonne), v1.8 (2921)	Asmodee Digital	3	0	0.0
Zoombinis (edu.terc.zoombinis), v1.0.12 (15)	TERC	3	2	0.0
Overdrive Premium (com.gsm.overdrivepremium), v1.8.1 (1810)	GEMMOB Adventure	3	0	0.0
Traffix (com.infinity.traffix), v6.0 (50)	InfinityGames.io	3	0	0.0
Peppa Pig: Holiday (com.peppapig.holiday), v1.2.6 (25)	Entertainment One	3	0	0.0
Rush Rally 3 (brownmonster.app.game.rushrally3), v1.86 (86)	Brownmonster Limited	3	0	0.0
Talisman (com.nomadgames.talisman), v28.00 (280000000)	Nomad Games	3	0	0.0
My PlayHome : Play Home Doll House (com.playhome), v3.6.2.24 (1527105011)	Shimon Young : Play Home Software	3	0	0.0
Mini Metro (nz.co.codepoint.minimetro), v2.41.0 (69)	Dinosaur Polo Club	3	0	0.0
Dr. Panda Firefighters (com.tribeplay.pandafirestation), v1.0 (4)	Dr. Panda	3	1	100.0
Dr. Panda Airport (com.tribeplay.pandaairport), v19.1.85 (191851425)	Dr. Panda	2	0	0.0
SimpleRockets 2 (com.jundroo.SimpleRockets2), v0.9.307 (30)	Jundroo, LLC	2	0	0.0
Bridge Constructor (com.headupgames.bridgeconstructor), v8.2 (802416)	ClockStone STUDIO	2	0	0.0
Rescue the Enchanter (com.lonewolfgames.rescueenchanter), v2.9 (29)	Syntaxity	2	1	0.0
Dr. Panda Restaurant 2 (com.tribeplay.pandarestaurant2), v1.96 (30)	Dr. Panda	2	0	0.0
SPACE INVADERS (jp.co.taito.am.spaceinvaders), v1.3.0 (7)	TAITO Corporation	2	0	0.0
BRIO World - Railway (se.filimundus.brriorailway), v4.0.3 (403)	Filimundus AB	2	0	0.0

(Table Continues)

Table 44 (Continued)

Top 5 Apps	Developer	# Requested	# Dangerous	% Dangerous Used
Dr. Panda Racers (com.drpanda.racers), v1.0 (2)	Dr. Panda	2	0	0.0
Dr. Panda Train (com.drpanda.train), v1.02 (3)	Dr. Panda	2	0	0.0
Dr. Panda School (com.drpanda.school), v1.2 (4)	Dr. Panda	2	0	0.0
Croco Adventure (com.sec.kidsplat.kidsbcg), v10.0.17 (1001700000)	SiDi	1	0	0.0
MathLand Full Version: Mental Math Games for kids (com.EducaGames.MathLandFull), v1.95 (195)	Didactoons	1	0	0.0
Pocket City (com.codebrewgames.pocketcitygame), v1.1.348 (10448)	Codebrew Games	1	0	0.0
Jet Car Stunts (com.trueaxis.jetcarstunts), v1.08 (9)	True Axis	1	1	0.0
Monster Numbers Full Version: Math games for kids (com.playtic.monsternumbersFull), v8.53 (853)	Didactoons	1	0	0.0
Gruffalo: Games (air.com.magiclightpictures.gruffalogamesAndroid), v1.1.1 (1001001)	Magic Light Pictures	1	0	0.0

C.3 Third-Party SDKs

We were able to identify 136 SDKs embedded within the 100 Kids apps. We list the 40 most common SDKs in Table 45,¹⁰⁴ along with the number of Kids apps in which they were detected.

Table 45: The 40 most common SDKs identified within apps in the Kids category.

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
Google Mobile Services	Google	Development Aid Advertisement Mobile Analytics Authentication	72	(72.0%)
Google Play	Google Play	App Market	61	(61.0%)
Firebase	Google	Development Aid Mobile Analytics Advertisement LBS Utility	58	(58.0%)
Fmod	Firelight Technologies	Game Engine	56	(56.0%)
Unity3D	Unity Technologies	Game Engine Mobile Analytics Advertisement	54	(54.0%)
Google Ads	Google	Advertisement	33	(33.0%)
Google DoubleClick	Google	Advertisement	33	(33.0%)
Facebook	Facebook	Social Network Advertisement Mobile Analytics	28	(28.0%)
Crashlytics	Google	Mobile Analytics	21	(21.0%)
Google Gson	Google	Development Aid	19	(19.0%)
Google Analytics	Google	Mobile Analytics	17	(17.0%)
Flurry	Verizon	Mobile Analytics	17	(17.0%)
Google Tag Manager	Google	Mobile Analytics	14	(14.0%)
Facebook Login	Facebook	Digital Identity Advertisement	13	(13.0%)

(Table Continues)

¹⁰⁴For an explanation of SDKs, see Section 4.1.2.

Table 45 (Continued)

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
		Mobile Analytics		
prime[31]	prime[31] - MikE	Development Aid Advertisement Mobile Analytics	13	(13.0%)
Amazon In-App Purchasing	Amazon	Payment	13	(13.0%)
Moat	Oracle	Mobile Analytics	12	(12.0%)
Facebook Analytics	Facebook	Mobile Analytics	12	(12.0%)
Facebook Share	Facebook	Social Network Advertisement Mobile Analytics	12	(12.0%)
Unity3d Ads	Unity Technologies	Advertisement	12	(12.0%)
ZXing ("Zebra Crossing")	ZXing Project	Development Aid	12	(12.0%)
AdColony	AdColony	Advertisement	10	(10.0%)
Vungle	Vungle	Advertisement	10	(10.0%)
Apache Common	The Apache Software Founda- tion	Development Aid	10	(10.0%)
Apache Http	The Apache Software Founda- tion	Development Aid	9	(9.0%)
Google Core Libraries for Java 6+	Google	Development Aid	8	(8.0%)
picasso	Square Inc.	Development Aid	8	(8.0%)
ChartBoost	Chartboost	Advertisement	8	(8.0%)
IronSource	IronSource	Advertisement Mobile Analytics	7	(7.0%)
Facebook Ads	Facebook	Advertisement	7	(7.0%)
Google Protocol Buffers	Google	Development Aid	6	(6.0%)
JavaX Annotation API	JavaX Annotation API	Utility	6	(6.0%)
Mono for Android	Mono for Android	Development Aid	6	(6.0%)
SLF4J	SLF4J	Development Aid	6	(6.0%)
cocos2DX	cocos2dx	Game Engine	6	(6.0%)

(Table Continues)

Table 45 (Continued)

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
Github	Github	Development Aid	6	(6.0%)
AppsFlyer	AppsFlyer	Mobile Analytics AdFraud	6	(6.0%)
Facebook Places	Facebook	Map/LBS Advertisement	6	(6.0%)
Google Core Libraries (3rd Party)	Google	Development Aid	5	(5.0%)
KIDOZ	KIDOZ	Advertisement	5	(5.0%)

Several of these SDKs included developer tools, which we characterize as SDKs that provide tools and functionality to app developers which are unlikely to be used for the transmission of user information. As a result, we separately present Table 46, which depicts the 40 most common SDKs with developer tools removed, along with the number of Kids apps in which they were detected.

Table 46: The 40 most common SDKs identified within apps in the Kids category, with developer tools removed.

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
Google Mobile Services	Google	Development Aid Advertisement Mobile Analytics Authentication	72	(72.0%)
Google Play	Google Play	App Market	61	(61.0%)
Firebase	Google	Development Aid Mobile Analytics Advertisement LBS Utility	58	(58.0%)
Unity3D	Unity Technologies	Game Engine Mobile Analytics Advertisement	54	(54.0%)
Google Ads	Google	Advertisement	33	(33.0%)

(Table Continues)

Table 46 (Continued)

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
Google DoubleClick	Google	Advertisement	33	(33.0%)
Facebook	Facebook	Social Network Advertisement Mobile Analytics	28	(28.0%)
Crashlytics	Google	Mobile Analytics	21	(21.0%)
Google Analytics	Google	Mobile Analytics	17	(17.0%)
Flurry	Verizon	Mobile Analytics	17	(17.0%)
Google Tag Manager	Google	Mobile Analytics	14	(14.0%)
Facebook Login	Facebook	Digital Identity Advertisement Mobile Analytics	13	(13.0%)
prime[31]	prime[31] - MikE	Development Aid Advertisement Mobile Analytics	13	(13.0%)
Amazon In-App Purchasing	Amazon	Payment	13	(13.0%)
Moat	Oracle	Mobile Analytics	12	(12.0%)
Facebook Analytics	Facebook	Mobile Analytics	12	(12.0%)
Facebook Share	Facebook	Social Network Advertisement Mobile Analytics	12	(12.0%)
Unity3d Ads	Unity Technologies	Advertisement	12	(12.0%)
AdColony	AdColony	Advertisement	10	(10.0%)
Vungle	Vungle	Advertisement	10	(10.0%)
ChartBoost	Chartboost	Advertisement	8	(8.0%)
IronSource	IronSource	Advertisement Mobile Analytics	7	(7.0%)
Facebook Ads	Facebook	Advertisement	7	(7.0%)
AppsFlyer	AppsFlyer	Mobile Analytics AdFraud	6	(6.0%)
Facebook Places	Facebook	Map/LBS	6	(6.0%)

(Table Continues)

Table 46 (Continued)

SDK Name	Parent Company	Category	# of Apps	(% of Apps)
		Advertisement		
KIDOZ	KIDOZ	Advertisement	5	(5.0%)
Applovin	AppLovin	Advertisement	5	(5.0%)
adjust	Adjust	Mobile Analytics Advertisement	5	(5.0%)
Inmobi	InMobi	Advertisement	4	(4.0%)
StartApp	StartApp	Advertisement Mobile Analytics	4	(4.0%)
Integral Ad Science	Integral Ad Science Inc.	Mobile Analytics Advertisement AdFraud	4	(4.0%)
Microsoft Appcenter Analytics	Microsoft	Mobile Analytics	6	(6.0%)
Microsoft Appcenter Crashes	Microsoft	Mobile Analytics	4	(4.0%)
Amplitude	Amplitude	Mobile Analytics	4	(4.0%)
MixPanel	Mixpanel	Mobile Analytics	3	(3.0%)
OneSignal	OneSignal	Mobile Analytics	3	(3.0%)
Tapjoy	Tapjoy	Advertisement	3	(3.0%)
Amazon Analytics	Amazon	Mobile Analytics	5	(5.0%)
PayPal	PayPal	Payment	2	(2.0%)
AppMetrica	Yandex	Mobile Analytics	2	(2.0%)