



Parent-Centric Privacy Framework for a Safe Cyber Environment for Children

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Privacy Research Symposium, December 15th 2016





CROW – 1st Uni Cyber Security Lab in NZ



- First Cyber Security Lab in NZ, building on traditions of NZ Internet, Data Mining (Weka), networking group
- 20+ research students (Honours, PGDip, Master of Cyber Security, PhD)
- 30+ Alumni (now at Gallagher, Deloitte, INTERPOL, Cloud Security Alliance, LayerX, etc)
- 14 staff (6 academics, 8 staff)
- Funded by MBIE Endeavour Fund (STRATUS), Fulbright Commission, InternetNZ, Education NZ, and Office of the Privacy Commissioner
- **Our Goal: To return control of data to users**



Who we work with:



• NZ Cyber Security Challenge

Creators of the New Zealand Cyber Security Challenge (now 3rd year; 267 participants)



Our Privacy Good Research Fund Supported Project

Parent-Centric Privacy Framework for a Safe Cyber Environment for Children



Our Sponsors



Privacy Commissioner
Te Mana Matapono Matatapu



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HIKINA WHAKATUTUKI



Our Project Goal

- Assist parents in preventing cyber threats and dangers of privacy illiteracy
- Help children preserve their Internet privacy through parent-assisted tools
- Provide parents with best practice tools/knowledge to maintain a safe cyber environment
- Promote initiatives & campaigns related to security and privacy awareness

SCKid – An Overview

- A parent-centric framework designed for parents (incl. guardians and teachers) to preserve and raise awareness of their child's privacy
- Combination of technological tools, knowledge base, and administrative policies to improve *a safe cyber environment*



Our Target Groups

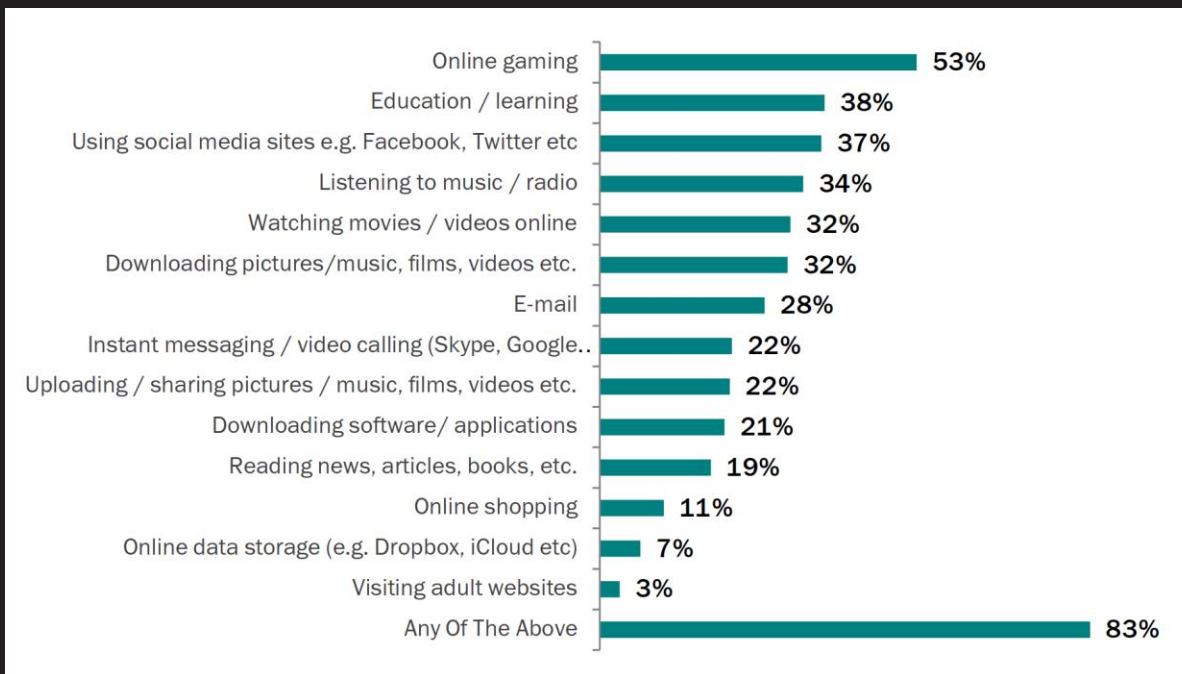


Parents

Teachers

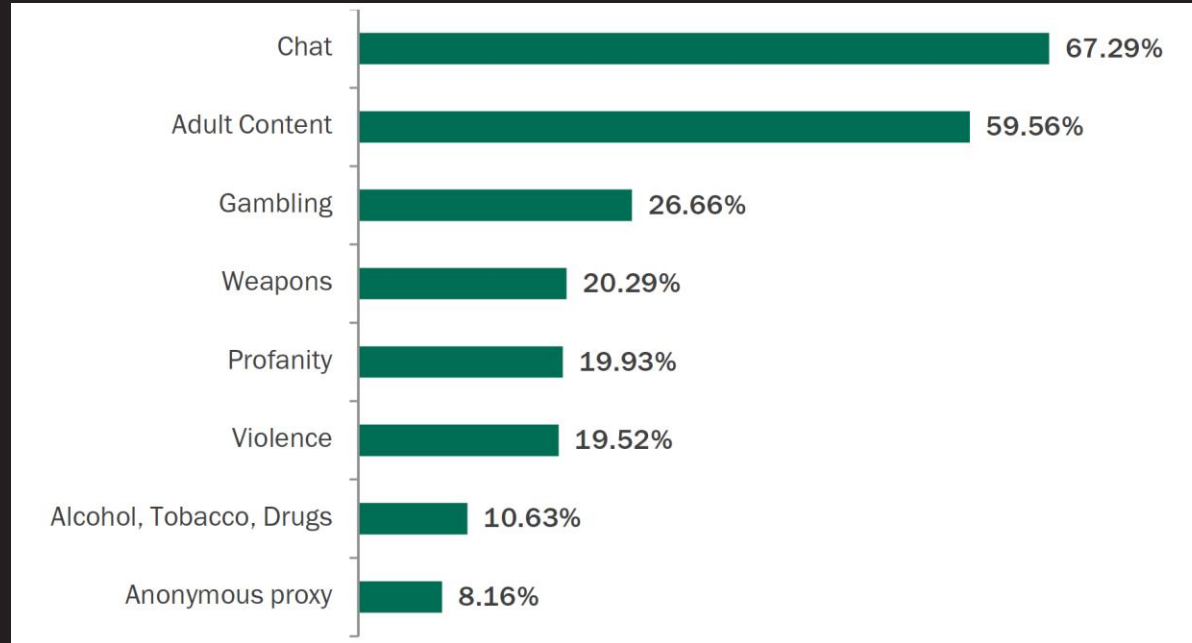
Children

What children use the Internet for



Reference: KASPERSKY LAB STUDY: CHILDREN ONLINE version 1.0, March 2015

Inappropriate contents



Reference: KASPERSKY LAB STUDY: CHILDREN ONLINE version 1.0, March 2015

Internet Threats to Children

- Privacy violations
- Children's posts affecting their lives
- Online scams
- Inappropriate contents
- Cyber bullying
- Pedophiles (cyberpredators, cyberstalkers)
- Malicious software (aka malware)

And many more...



Online Scams

stuff National World Business Tech Sport Entertainment Life & Style Travel More

businessday

Industries Small Business Money Property Farming World Better Business Nurture C

New Zealanders lose \$12m to scams

CHLOE WINTER
Last updated 12:14, January 1 2016



Kiwis have lost more than \$12 million so far this year to scammers.

Vulnerable Kiwis falling victim to scams seems to be endless, with more than 8000 calls to NetSafe over the past year.

As a result, people have lost in excess of \$12 million to scammers between January and November.

Here are some of the worst – and most unusual scams – this year.

1. "You've been caught watching porn": Android users scammed with fake police "fines" for viewing porn

A message claiming to be from the police cyber crime unit and the GCSB told Android users they had to pay a \$20 fine for accessing pornography or illegally shared movies.

Newshub. AUCKLAND 20° 15°

NZ WORLD POLITICS SPORT HEALTH ENTERTAINMENT MONEY WEATHER

Ticket scam ends young fan's Rugby World Cup dream

Thursday 10 Sep 2015 1:30 p.m.

Share this story



Related

- Romania's Florin Surugiu marries partner after Rugby World Cup proposal
- Sporting highlights of 2015
- Sporting highlight of 2015: ABE RWC victory
- Top 10 sporting fails of 2015
- No positive doping tests at Rugby World Cup

Tags

- #Rugby World Cup 2015
- #All Blacks
- #Rugby Teams

A ticketing scam has ended a four-year-old All Blacks fan's hopes of seeing them play at the Rugby World Cup.

Lexi Daley from Greytown was headed to Wembley Stadium in London to see New Zealand take on Argentina in their World Cup opener before mum Gillian found out overnight the tickets were fake.

Gillian paid \$1800 for seven tickets from www.getsporting.com in January, but after having still not received the tickets a week out before flying to the United Kingdom, Gillian called the number listed on the website only to discover a message from the UK Serious Fraud Office.



A fake Rugby World Cup ticket (Credit: England Rugby)

"I'm absolutely gutted. I just couldn't believe it," Gillian said.

References: <http://www.stuff.co.nz/business/money/75536670/New-Zealanders-lose-12m-to-scams>

<http://www.newshub.co.nz/sport/ticket-scam-ends-young-fans-rugby-world-cup-dream-2015091013>



Privacy Violations



- Data monitored/collected by Internet-connected services/apps
- Online scams (incl. phishing)
- Parental-control software
- Malware (e.g. spyware, adware)
- Children's privacy illiteracy

Cyber Bullying

- Nearly 43% of kids have been cyber bullied
- 25% of them have experienced cyber bullying more than once
- 10% of cyber bullying victims will inform a parent of their abuse
- Cyber bullying victims are 2-9 times more likely to consider committing suicide



Reference: NoBullying.com, <https://nobullying.com/facts-about-cyber-bullying/>, 25/10/16 (Accessed 10/11/16)

Family of 12-year-old who died suddenly warn of the dangers of online bullying

BEVAN HURLEY

Last updated 08:15, March 13 2016



SUPPLIED

Palmerston North intermediate student Kyana Vergara died suddenly in February.

The family of a 12-year-old girl who died in a suspected suicide have spoken out about the dangers of online bullying.

Kyana Vergara died suddenly at her Palmerston North home on January 11. Her death is the subject of a coroner's inquiry.

Sister Aundrea Denoon described Kyana as having a "heart of gold".

"She had so much to live for, she wanted to be a social worker and had an amazing voice once she got over her shyness, we were meant to be at her graduation and dance and give her away at her wedding and most of all she was meant to have a family of her own.

Reference:

<http://www.stuff.co.nz/national/77741208/family-of-12-year-old-who-died-suddenly-warn-of-the-dangers-of-online-bullying>

Relate work – Parental Control

- Only 22% of parents use parental control solutions (*KASPERSKY LAB, 2015*)
- Most parental control tools strictly use hard-control which can violate children's privacy
- Yet another open question: How can we balance privacy and safety/security?

Example –

KidLogger, Parental Control App for Android, Windows, Mac

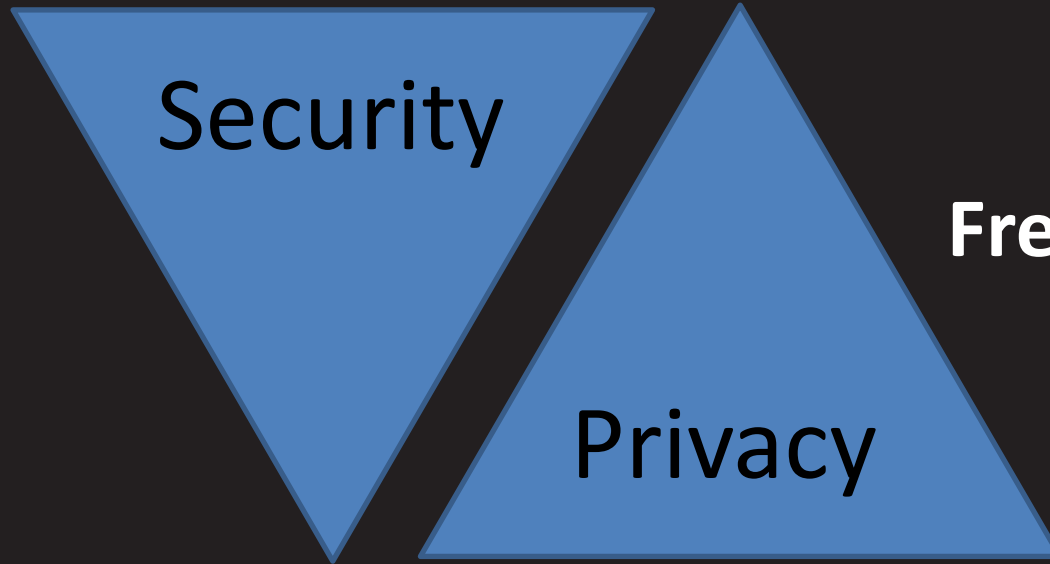
What KidLogger can do

- Web history monitor
- Time tracking
- Record keystrokes (i.e. keylogger)
- Remote screenshots
- Record used files/folders
- Track used apps
- Voice monitoring
- Monitor messengers (e.g. Facebook, WhatsApp, etc)
- Record call voice (mobile version)
- Remotely view all photos created with camera (mobile ver.)



And many more...

Balance between security & privacy for kids



Freedom of expression

Related Acts

- **Children's Online Privacy Protection Act 1998 (US)**
 - Protect privacy of children under 13
 - Place parents in control over children's information collected by operators
- **Privacy Act 1993 (NZ)**
 - Define 12 privacy principles
- **Harmful Digital Communications Act 2015 (NZ)**
 - Help victims affected by harmful digital communications (e.g. cyberbully)
 - Penalise perpetrators causing harmful digital communications

Requirements of the SCKid Framework



Control

Audit

Remediation

Evidence Collection

Knowledge



Implemented SCKid Prototype



Mobile Device Management

Empower parents & children to secure websites and mobile applications



Web-based Privacy Management

Enable parents to guard children's mobile and social network usage



Knowledge-base

Educate children & parents about privacy preservation and encourage communication

SCKid Prototype – Mobile App



Android app (compatible with Android 4.4+)

- Web blocking (incl. requestable access)
- App blocking
- Panic button
- Context-aware security (only Proof-of-Concept)



SCKid Prototype – Web App



Web app (based on Laravel, a PHP MVC framework, and Wordpress)

- Social network logging and feedback (supporting Facebook & Twitter)
- Mobile device logging (SMS, call, GPS)
- Web access control (based on OpenDNS)
- Mobile app control (blocking/unblocking apps)
- Knowledge-base (articles about online privacy, security, and safety)



Publication

- Sivadon Chaisiri, and Ryan Ko, “From Reactionary to Proactive Security: Context-Aware Security Policy Management and Optimization Under Uncertainty” in *Proceedings of 15th IEEE International Conference on Trust, Security and Privacy in Computing and Communications* (IEEE TrustCom-16), Tianjin, China, 23-26 August, 2016.



Screenshots of SCKid Prototype



WELCOME TO SCKID KNOWLEDGE BASE

Protecting children online by encouraging child-parent
communication and raising the awareness of privacy issues.

Available for download



Exit

- PARENTAL CONTROLS FOR COMPUTERS AND MOBILE -



Website: sckid.org



PARENTAL CONTROLS READY IN YOUR COMPUTER

INTRODUCTION TO PARENTAL CONTROLS

Parental controls are special features used on television, computers, and mobile devices (e.g. cellphones and tablets) to control children's access to harmful and offensive material. They can also be used to restrict children's access to a number of digital applications or media based on the time spent on the devices or a specific time. Parental controls on mobile phones can also be used to track the location of the children at any given time.

WHY USE PARENTAL CONTROLS

The use of parental controls on devices is critical to ensure children's experiences on the Internet are safe, enjoyable and a positive learning environment. Parents can use parental controls for a number of different reasons, e.g. protecting children from harmful material on the Internet (e.g. using a browser to access pornographic websites), enforcing a time to stop using mobile applications such as Facebook or Instagram, ensuring children can only play games and use applications that are child-friendly, tracking the child's location if they are lost on the way home, seeing how much time the children spend on Facebook and other social media sites, among others.

WHAT PARENTAL CONTROL OPTIONS ARE AVAILABLE?

Parental controls can be grouped into 4 different types, namely: websites, enforcing a time to stop using mobile applications such as Facebook or Instagram, ensuring children can only play games and use applications that are child-friendly, tracking the child's location if they are lost on the way home, seeing how much time the children spend on Facebook and other social media sites, among others.




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Dashboard



Hans



Fabian

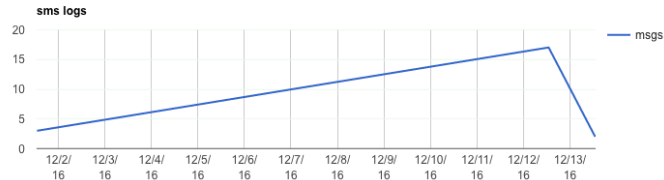


Claudie



Tess

Top SMS



Top Calls



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Show 10 entries

Search:

Contact	Phone Number	Start Time	End Time
Isalas	451-820-6991	2016-12-07 15:02:40	2016-12-07 19:21:43
Lisandro	+1-517-569-7196	2016-12-02 13:23:50	2016-12-04 18:42:41
Rozella	1-541-471-0298	2016-11-28 22:10:21	2016-12-05 07:59:03
Sivadon Chaisiri	02102405106	2016-12-12 19:22:54	2016-12-12 19:22:58
Sivadon Chaisiri	02102405106	2016-12-12 19:22:54	2016-12-12 19:22:58
Sivadon Chaisiri	02102405106	2016-12-12 19:22:54	2016-12-12 19:22:58
Sivadon Chaisiri	02102405106	2016-12-12 19:22:54	2016-12-12 19:22:58

Showing 1 to 7 of 7 entries

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SMS Logging

[SYNC](#)

SMS History

U	<Not in contact list> +642102405106 Hans .. How are you?	2016-12-13 16:02:20
U	<Not in contact list> 7466 Welcome to Spark. For internet access through our network check your device APN settings are set to: internet. Go to www.spark.co.nz/apn on a PC for help	2016-12-13 16:00:31
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04
U	Sivadon Chaisiri +642102405106 Help me please	2016-12-12 19:22:04




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Posts

Posts 6

[Refresh posts](#)

Status	Picture	Comments	Posted Time	
Don't know what to eat today... Any suggestion?	No picture	No comments	2016-12-13 01:46:42	
A photo	Show Picture	No comments	2016-12-13 01:25:48	
My phone number is 555-1234	No picture	No comments	2016-12-13 01:21:27	
My address is 123 fake street, Hamilton	No picture	No comments	2016-12-13 01:21:18	
Im going to a party	No picture	No comments	2016-12-13 01:20:57	
Yay my new FB account	No picture	No comments	2016-12-13 01:20:49	


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Mobile Applications

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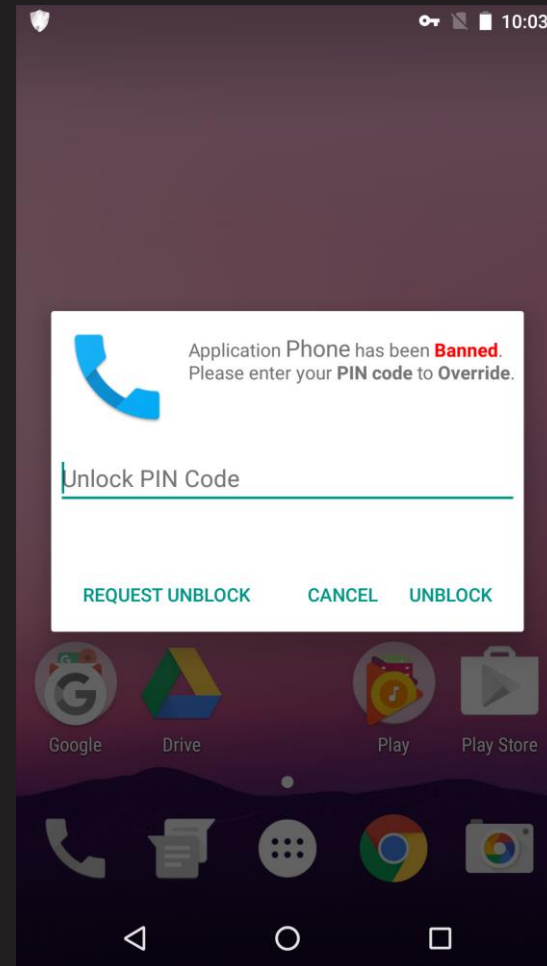
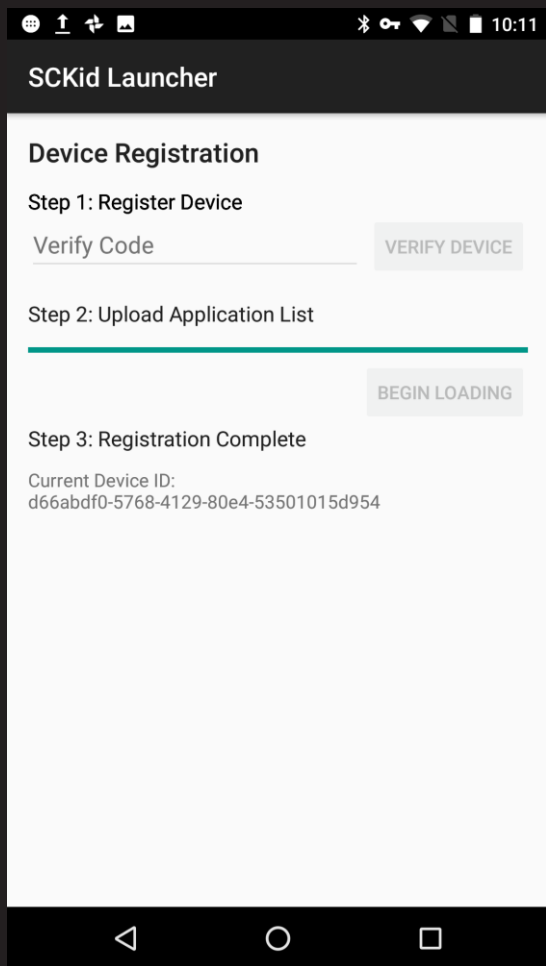
Change App settings below for: Hans 71

[Add new App](#)

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	YouTube	Blocked
	Android Services Library	Allowed
	Phone and Messaging Storage	Blocked
	ConnMO	Allowed
	Google App	Blocked



Demo Clip : SCKid Prototype



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Open Discussion – Q&A

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