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

SCKid
Safe Cyber Kid Framework

Privacy Commissioner
Te Mana Matapono Matatapu

STRATUS
Returning Data Control to Users

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Our Project Goal

SCKid
Safe Cyber Kid Framework

- 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

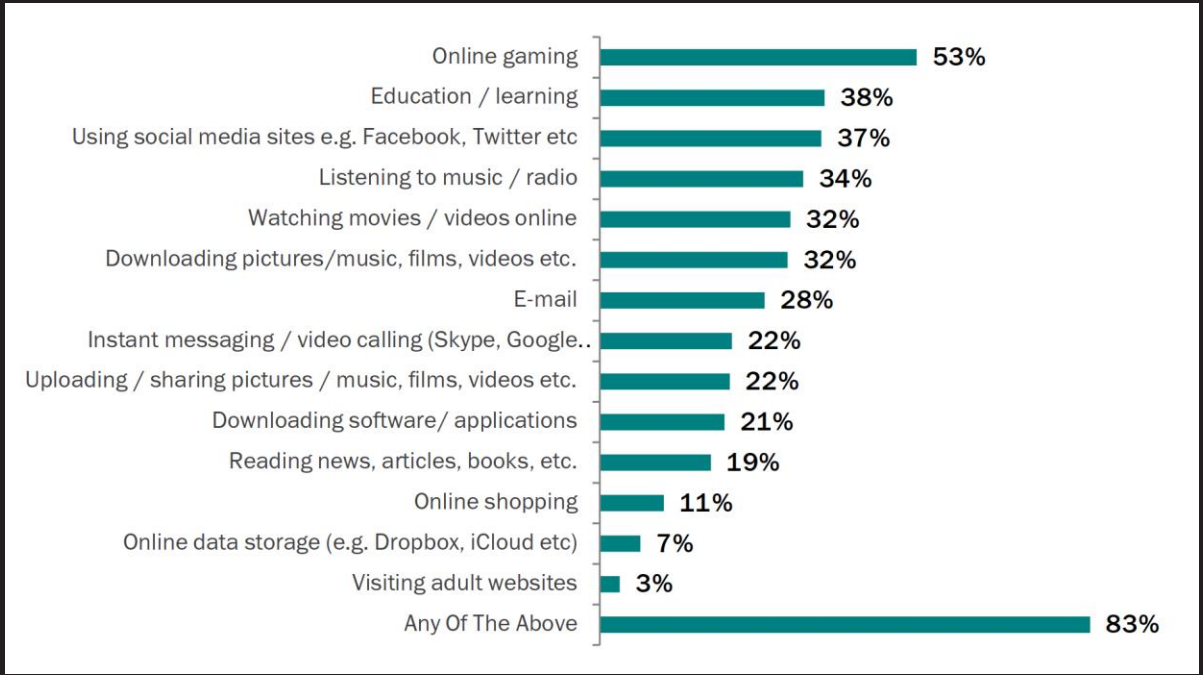
SCKid
Safe Cyber Kid Framework

Parents

Teachers

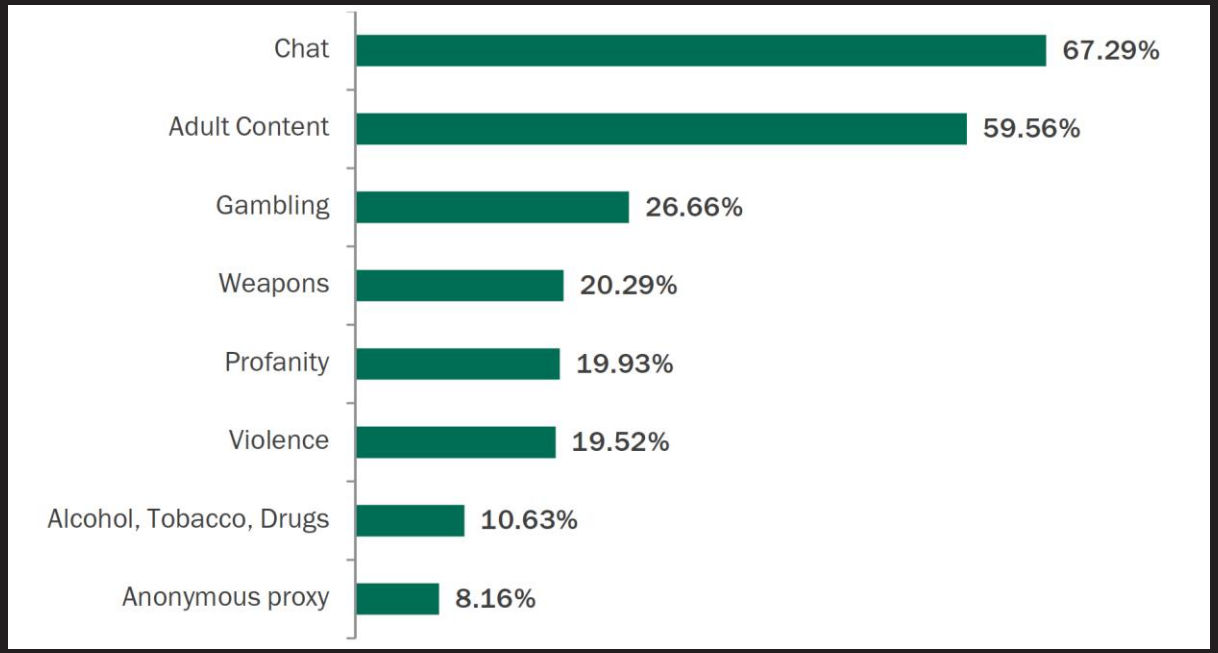
Children

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

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Safe Cyber Kid Framework

- 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

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New Zealanders lose $12m to scams

CHLOE WINTER
Last updated 12:14, January 1 2016

123RF

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 $200 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 Suruglu marries partner after Rugby World Cup proposal
- Sporting highlights of 2015
- Sporting highlight of 2015: ABs' 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 Dailey 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

Credit: DoSomething.org

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

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national

NZ earthquake Crime Politics Science Education Health 1 NEWS NOW Weather

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.

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Safe Cyber Kid Framework

Reference:
http://www.stuff.co.nz/national/77741208/family-of-12yearold-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

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Safe Cyber Kid Framework

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.)

KidLogger

And many more…

Balance between security & privacy for kids

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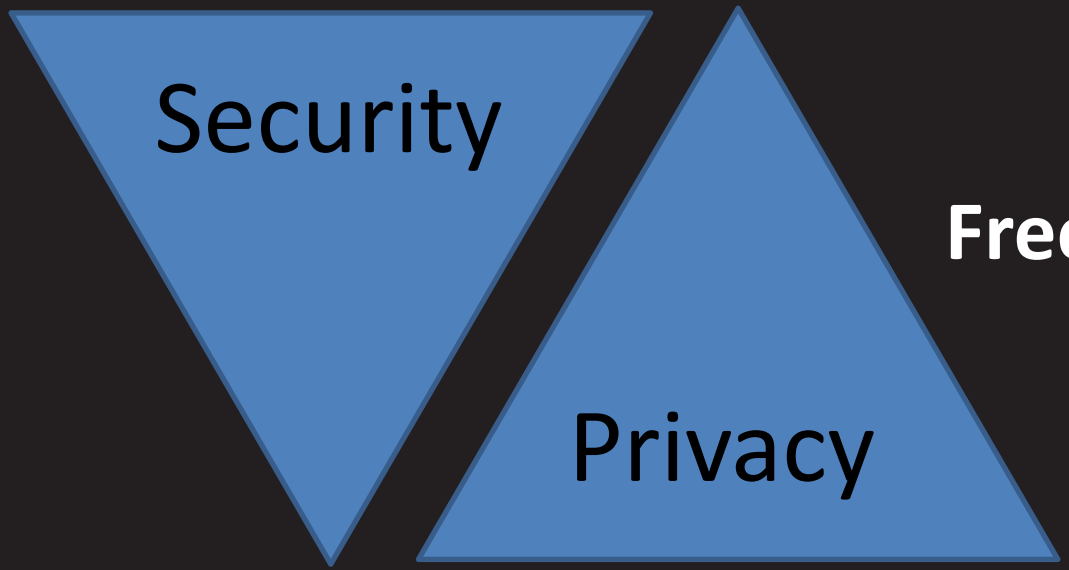
Safe Cyber Kid Framework



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

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Safe Cyber Kid Framework

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

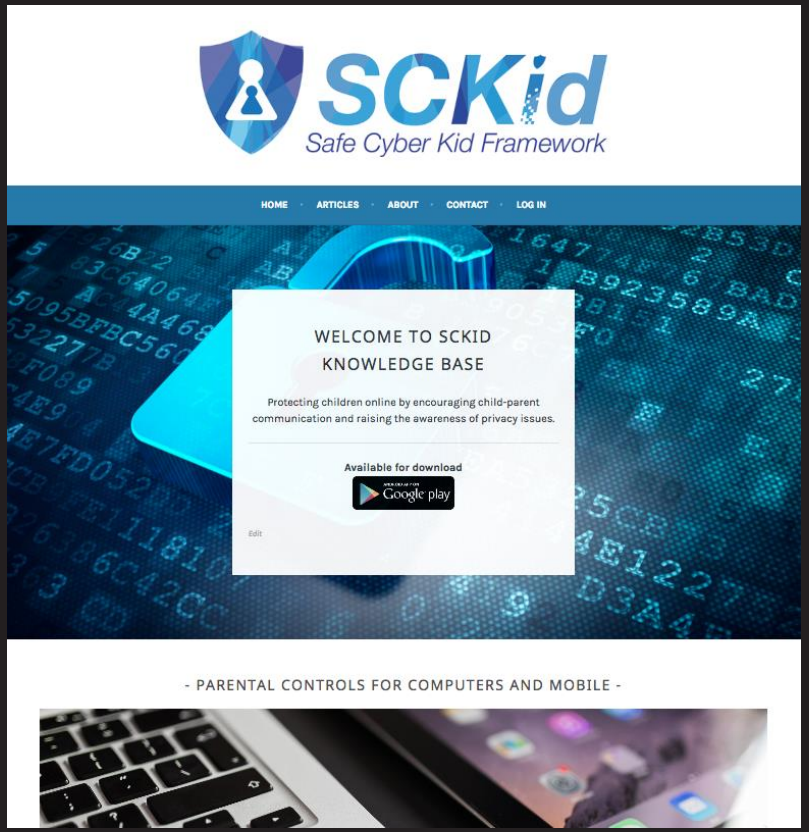
Web app (based on Laravel, a PHP MVC framework, and Wordpress)

- 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



Website: sckid.org

PARENTAL CONTROLS READY IN YOUR COMPUTER

Edit

INTRODUCTION TO PARENTAL CONTROLS

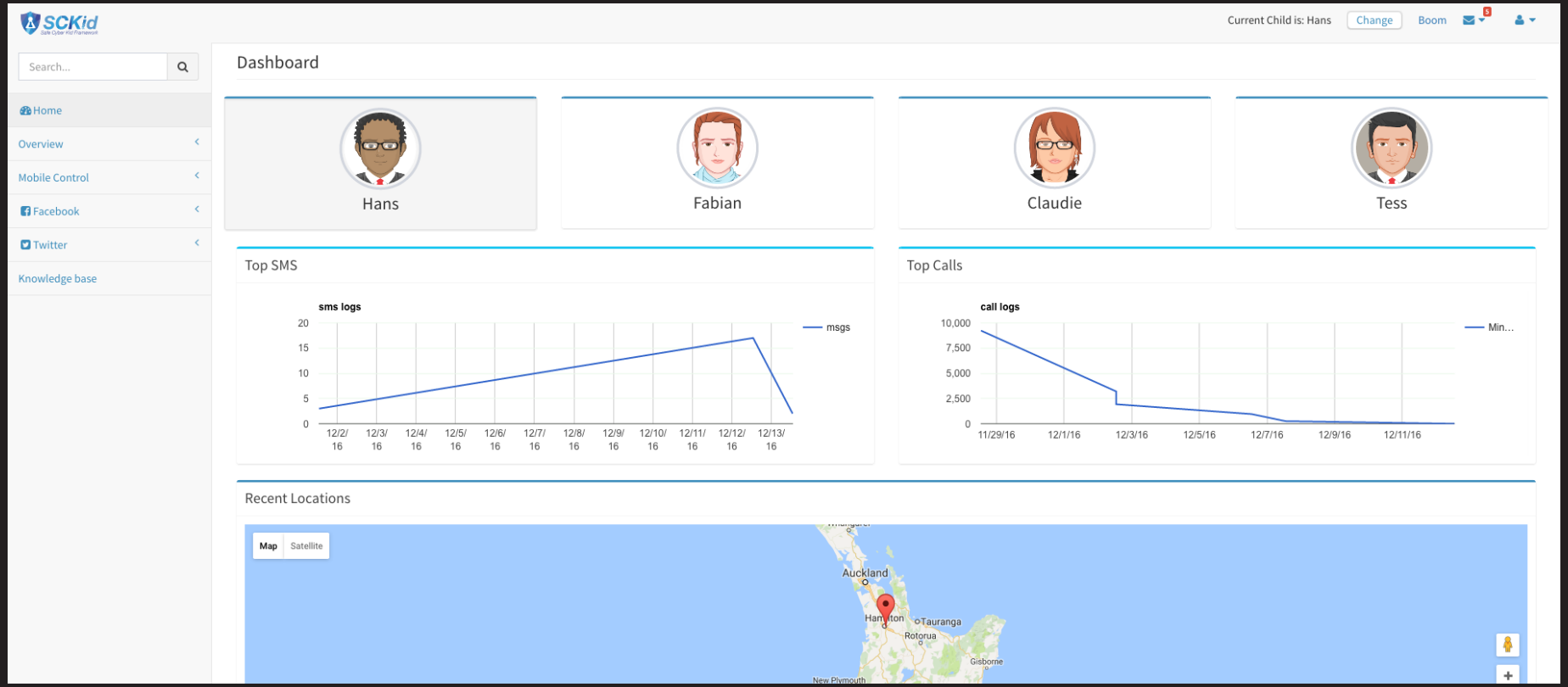
Parental controls are special features used on television, computers, and mobile devices (e.g. cellphones and tablets) to control children's access to harmful and offensive material. They can also be used to restrict children's access to a number of digital applications or media based on the time spent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


SCKid
Current Child is: Hans
Change
Boom
Search...
Dashboard
Home
Overview
Mobile Control
Facebook
Twitter
Knowledge base
Hans
Fabian
Claudie
Tess
Top SMS
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Top Calls
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10,000
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5,000
2,500
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11/29/16
12/1/16
12/3/16
12/5/16
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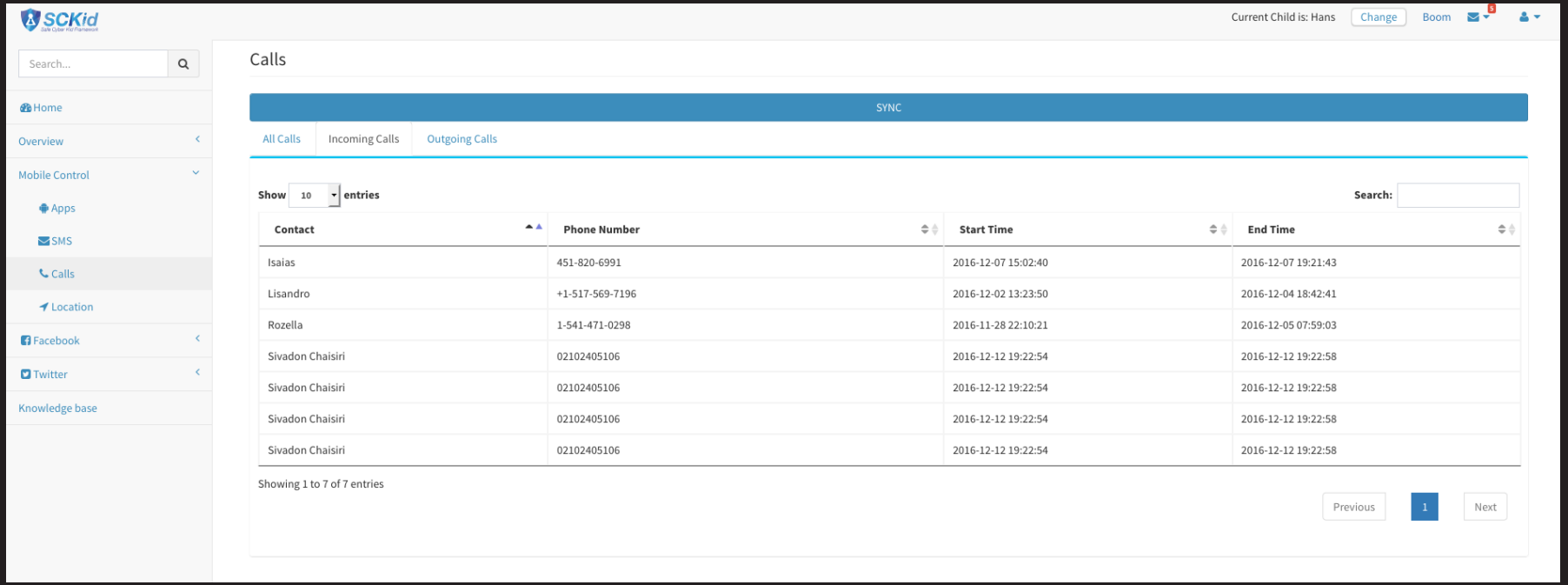
Tauranga
Rotorua
Gisborne
New Plymouth


SCKid
Current Child is: Hans
Change
Boom
Search...
Home
Overview
Mobile Control
Apps
SMS
Calls
Location
Facebook
Twitter
Knowledge base
Calls
SYNC
All Calls
Incoming Calls
Outgoing Calls
Show 10 entries
Search:
Contact
Phone Number
Start Time
End Time
Isaias 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
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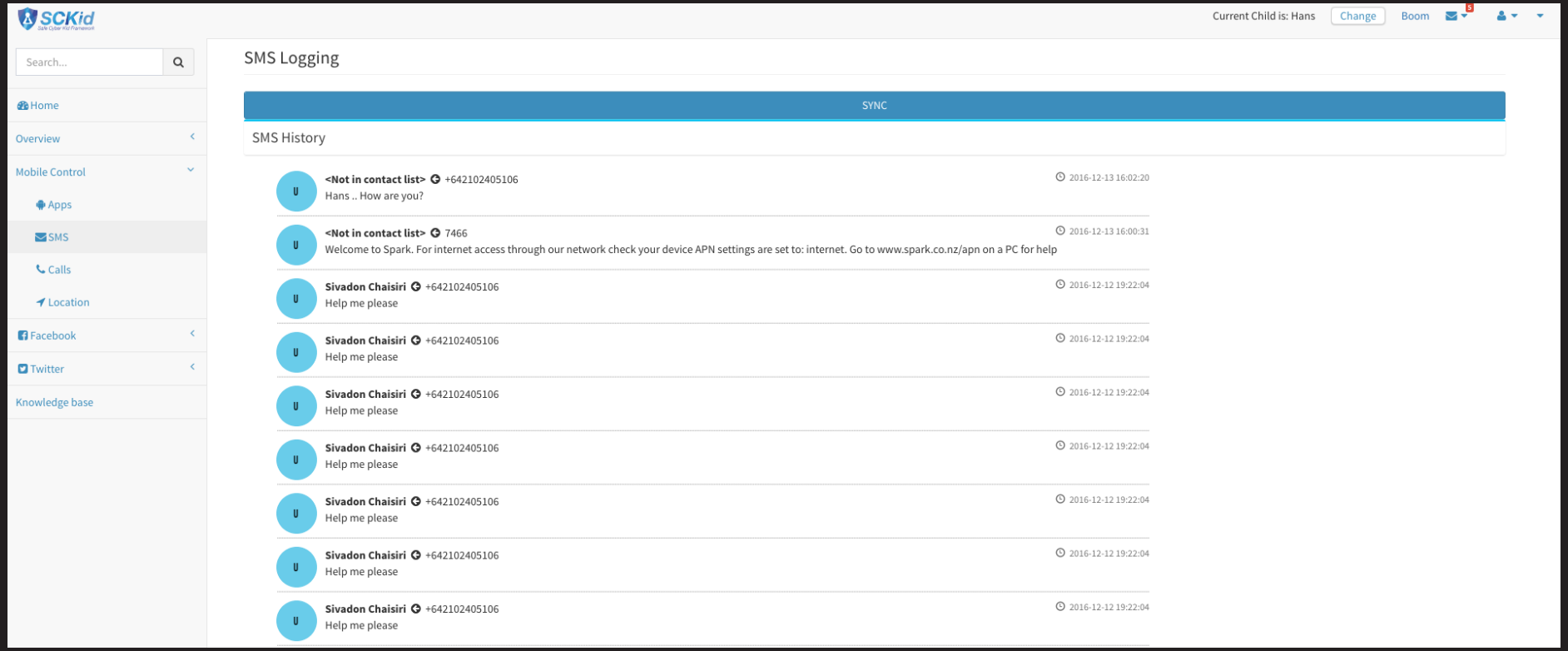
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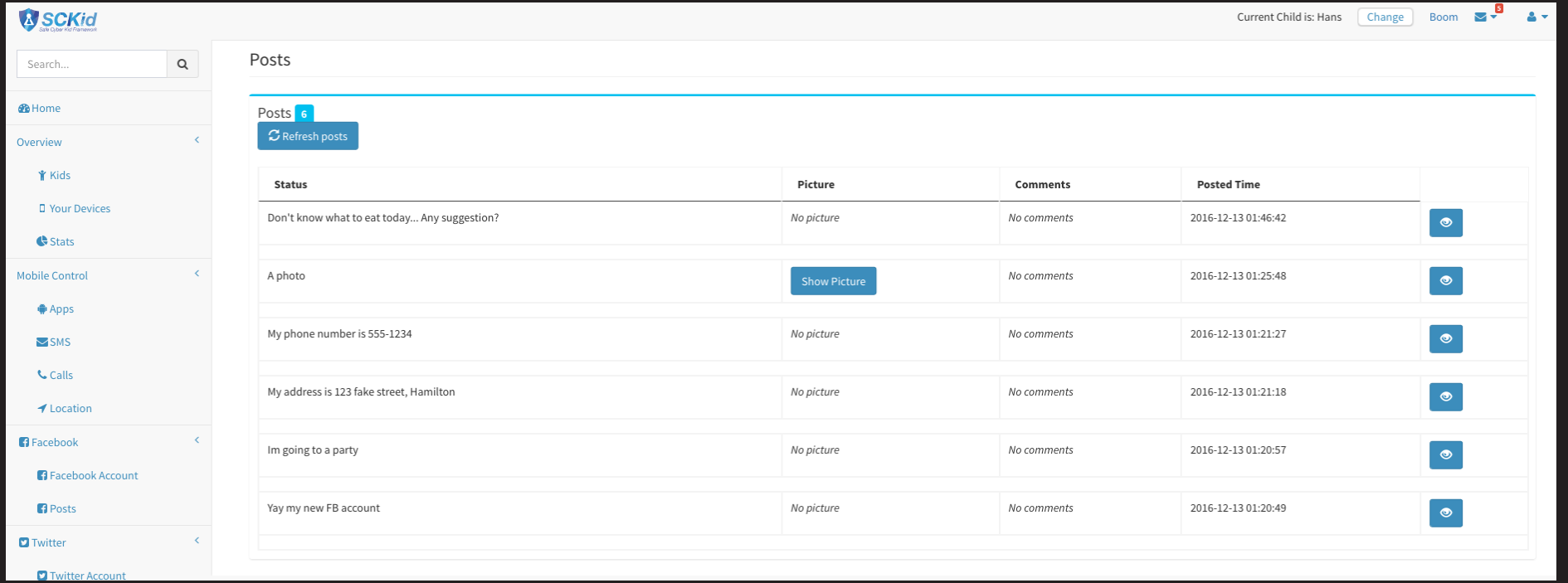
Mobile Control
Apps
SMS
Calls
Location
Facebook
Twitter
Knowledge base
SMS Logging
SYNC
SMS History
<Not in contact list> +642102405106
Hans .. How are you?
2016-12-13 16:02:20
<Not in contact list> 7466
Welcome to Spark. For internet access through our network check your device APN settings are set to: internet. Go to www.spark.co.nz/apn on a PC for help
2016-12-13 16:00:31
Sivadon Chaisiri +642102405106
Help me please
2016-12-12 19:22:04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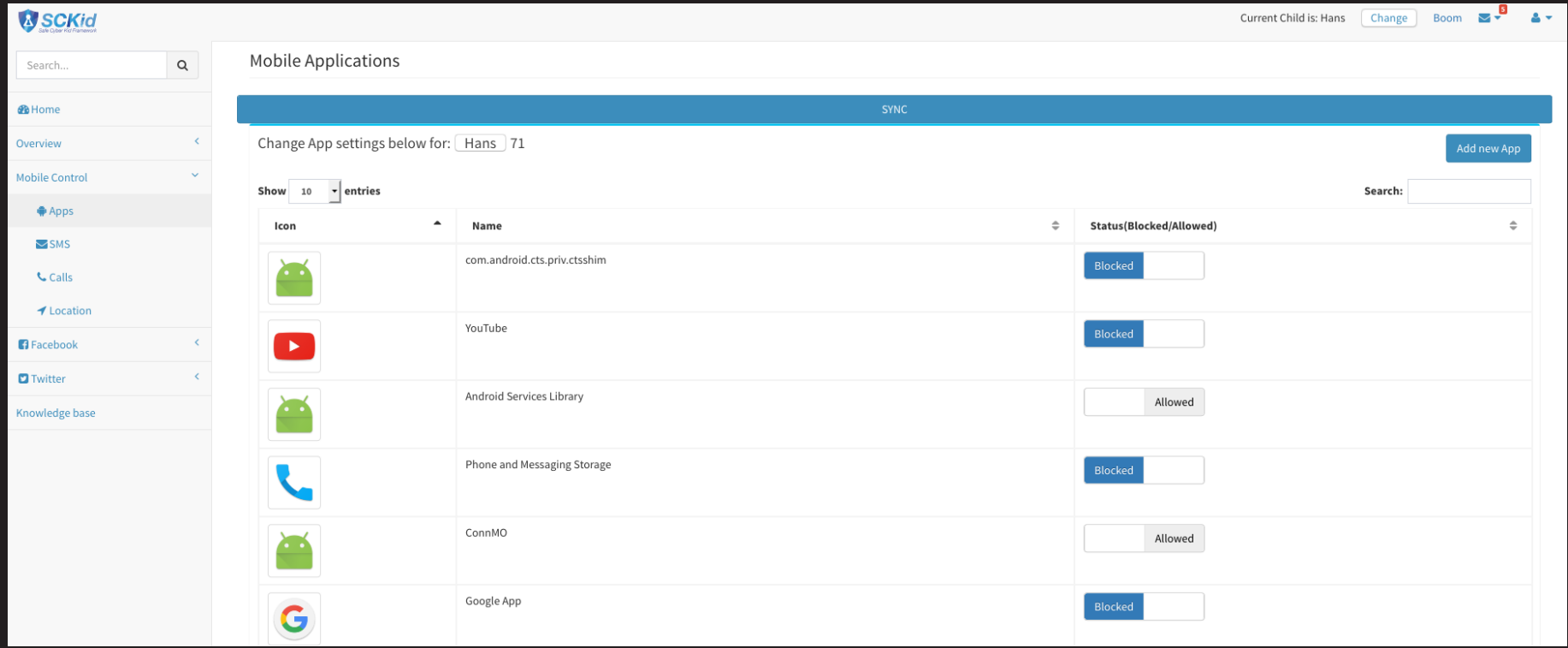
SMS
Calls
Location
Facebook
Facebook Account
Posts
Twitter
Twitter Account
Posts
Posts 6
Refresh posts
Status
Picture
Comments
Posted Time
Don't know what to eat today... Any suggestion?
No picture
No comments
2016-12-13 01:46:42
A photo
Show Picture
No comments
2016-12-13 01:25:48
My phone number is 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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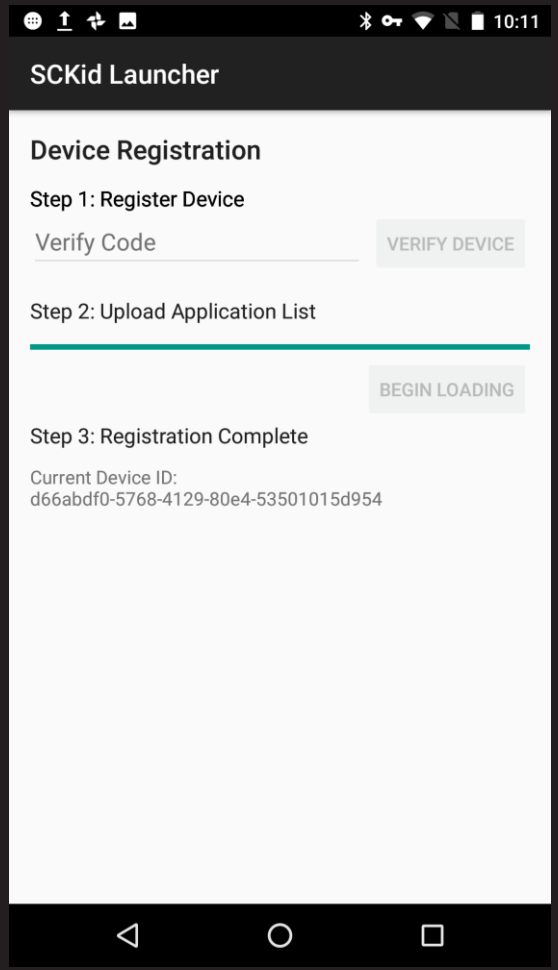
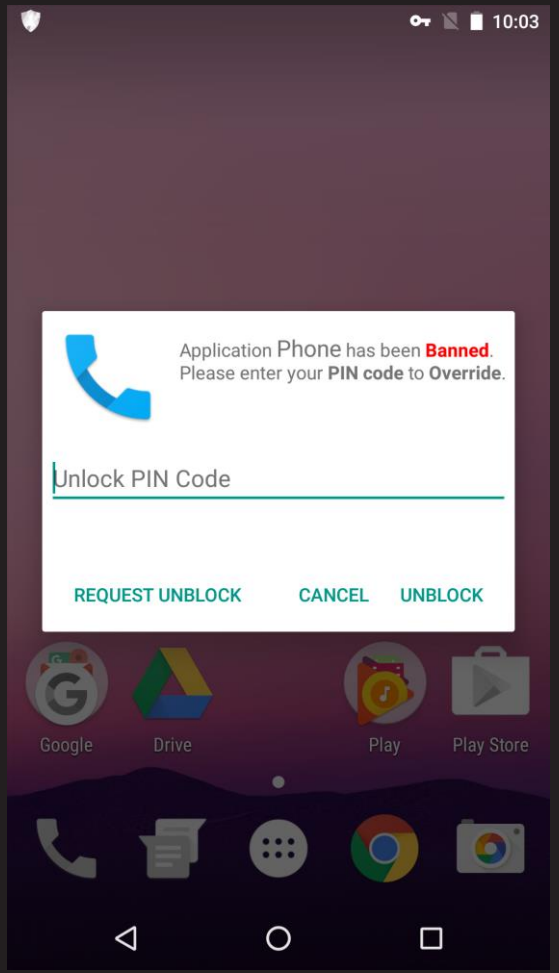
SYNC
Change App settings below for: Hans 71
Add new App
Show 10 entries
Search:
Icon
Name
Status(Blocked/Allowed)
com.android.cts.priv.ctsshim
Blocked
YouTube
Blocked
Android Services Library
Allowed
Phone and Messaging Storage
Blocked
ConnMO
Allowed
Google App
Blocked


10:11
SCKid Launcher
Device Registration
Step 1: Register Device
Verify Code
VERIFY DEVICE
Step 2: Upload Application List
BEGIN LOADING
Step 3: Registration Complete
Current Device ID:
d66abdf0-5768-4129-80e4-53501015d954


10:03
Application Phone has been Banned.
Please enter your PIN code to Override.
Unlock PIN Code
REQUEST UNBLOCK
CANCEL
UNBLOCK
Google
Drive
Play
Play Store

SCKid
Safe Cyber Kid Framework

Demo Clip : SCKid Prototype

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Open Discussion – Q&A

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