



Carat: Before and After

Eemil Lagerspetz, Ella Peltonen, Jonatan Hamberg,
Sasu Tarkoma
Carat Project
NODES group
University of Helsinki

Outline

- Carat
- Support Infrastructure
- Carat Application: Before and After
- Android Update
- iOS Update
- iOS issue: 9+ process list removed
- iOS issue: Bugs not allowed

Carat

- Research project
 - Crowdsourced data collection
 - Produce high quality research
- But also public app
 - Needs to be useful to users
 - Needs to be attractive
 - So we keep getting data
- And Infrastructure to support the app
 - Data reception servers
 - Data analysis service

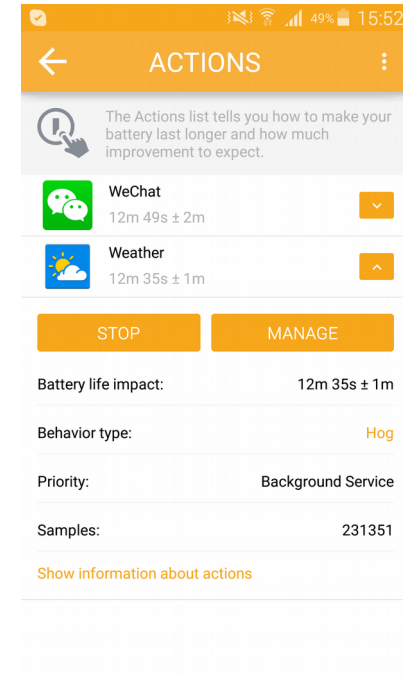
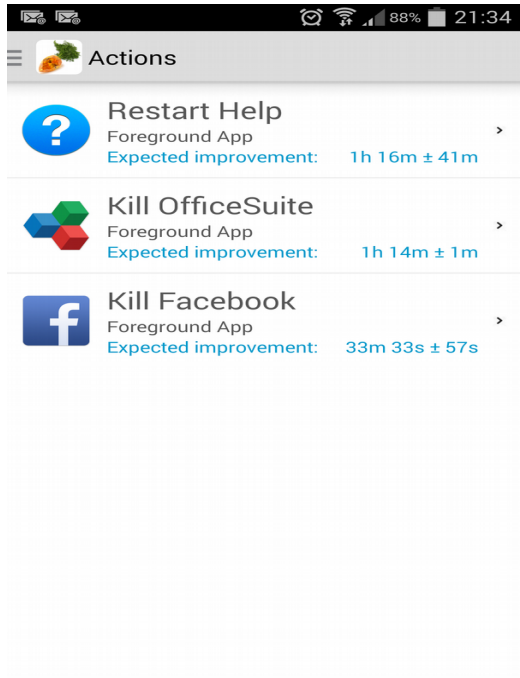


Carat Client is open-source:
<https://github.com/carat-project/carat>

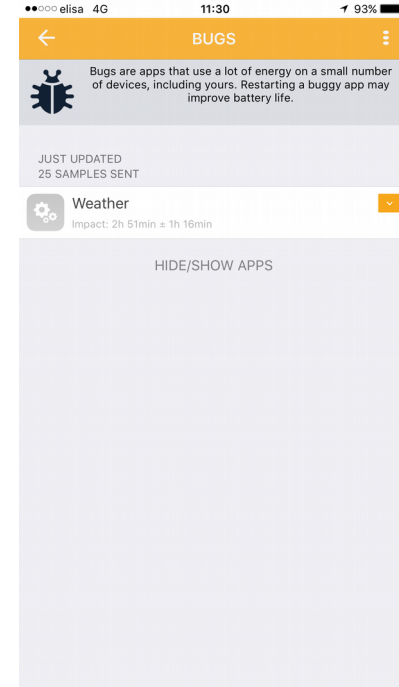
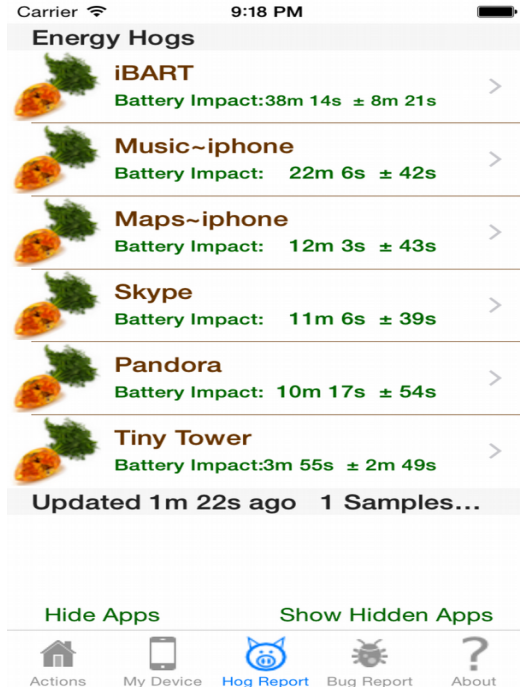
Support Infrastructure

- 4 servers running Carat Protocol server
 - Protocol needs updates, servers need maintenance
 - Amazon sometimes kills the servers, backups needed
- Big Data Storage: Amazon S3
 - Relatively maintenance free
- Data Analysis Service
 - Automation, updates, new features for research and app purposes

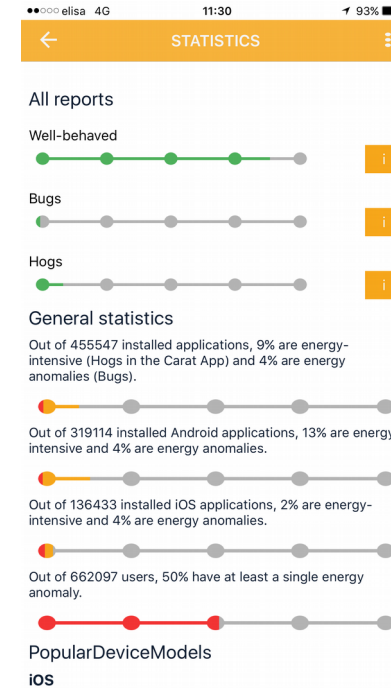
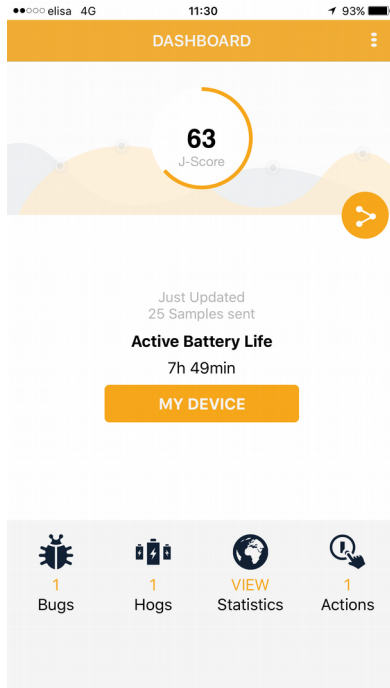
Carat Application: Before and After



Carat Application: Before and After



New Dashboard and Statistics



New Questionnaire support

- https://dl.dropboxusercontent.com/u/16721377/2016_07_05_18_01_56.mp4
- Allows giving users custom questionnaires without updating the app
 - Uses one extra Amazon EC2 server with additions to the Carat Protocol
 - Questionnaires defined in JSON and transmitted as Thrift objects

iOS and Android Updates

- New UI design done by an external party
- Code is not easy to extend
- Hours of work to implement e.g. custom action items, new Carat Settings, Questionnaires
- Bugs were also present in the work
 - Even one causing Carat to use much more battery than it should
 - Energy Bug, exactly what Carat is supposed to detect (!)

iOS issue: Processlist on iOS 9+

- Apple blocked access to the process list sys call in iOS 9
 - Workarounds exist
- Apple blocked access to most workarounds in iOS 9.3.3
 - WIP
- https://www.dropbox.com/s/rvhirlv53phv8ho/ios_9.3.2_processlist.mov

iOS issue: Bugs not allowed

- Apple does not allow the word “Bug” in AppStore apps.
- *Safety - 1.1.6*
- *The app provides potentially inaccurate diagnostic functionality for iOS devices to the user. Specifically, your app purports to identify bugs and other anomalies on the iOS device.*
- *Currently, there is no publicly available infrastructure to support iOS diagnostic analysis. Therefore, your app may report inaccurate information which could mislead or confuse your users.*

iOS issue: Misleading...

- So we removed mentions of “bug” or “anomaly” and got:
- *Safety - 1.1.6*
- *Your app's metadata contains misleading content or content that is intended to trick users into believing that your app actually provides the simulated functionality.*
- *Please remove or revise any misleading content for your app and its metadata.*

Takeaways

- Maintaining an app and its support infrastructure takes a lot of work
- Apple is closing access to see running apps
 - Carat as we know it will not be possible on future iOS versions
- Android version still works as before
- Carat will still monitor phone settings and in the future recommend best settings for you

Thanks

Eemil Lagerspetz
eemil.lagerspetz@cs.helsinki.fi