Smartphone energy considerations (for browser design)

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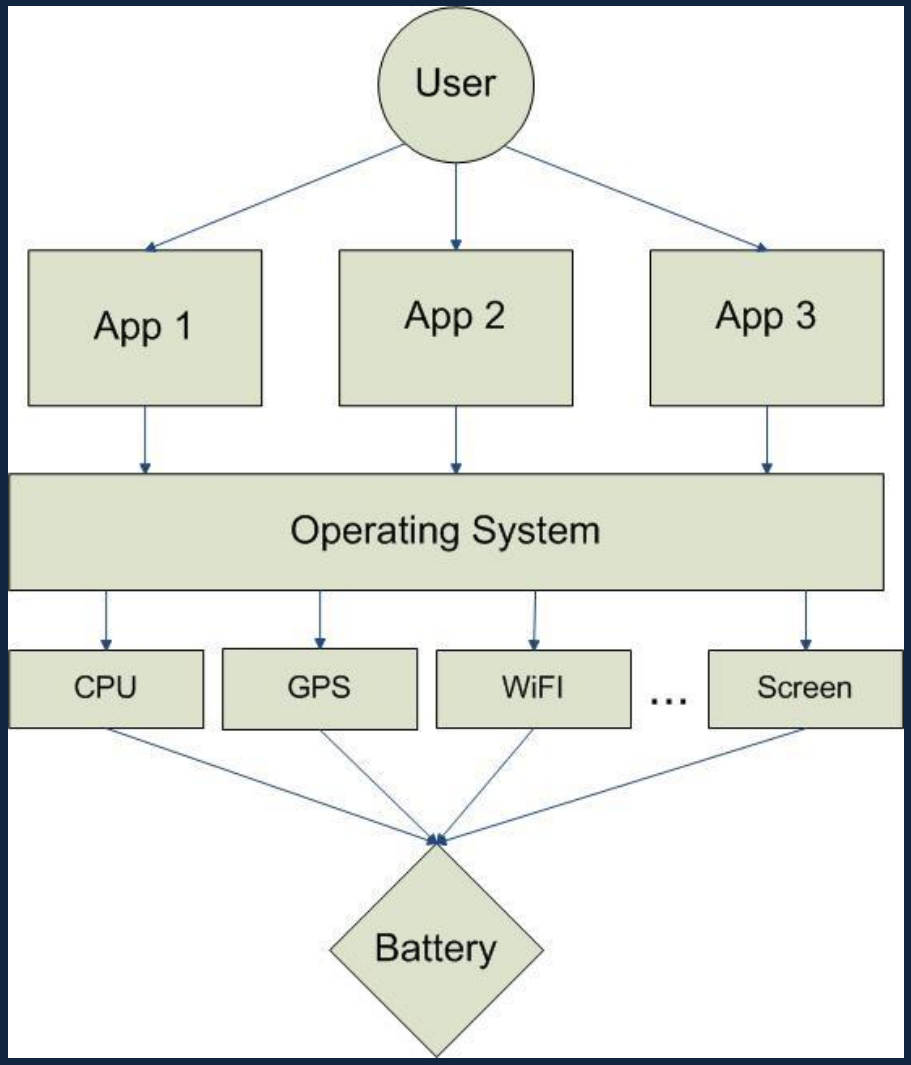
Microsoft Research

Smartphone energy use



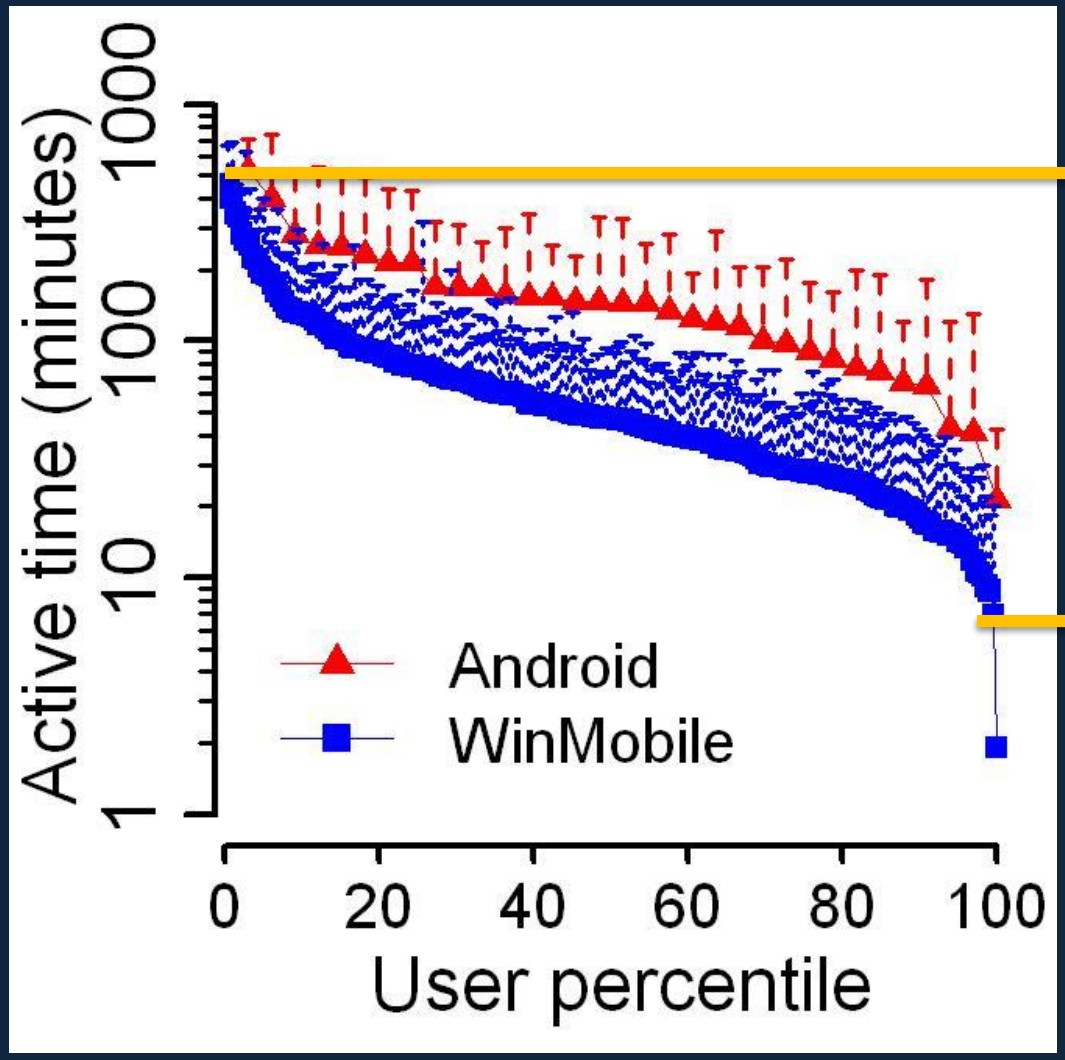
High diversity of users motivates adaptation

Users run many apps, and no one app dominates.

Accounting for low-level device behavior is critical

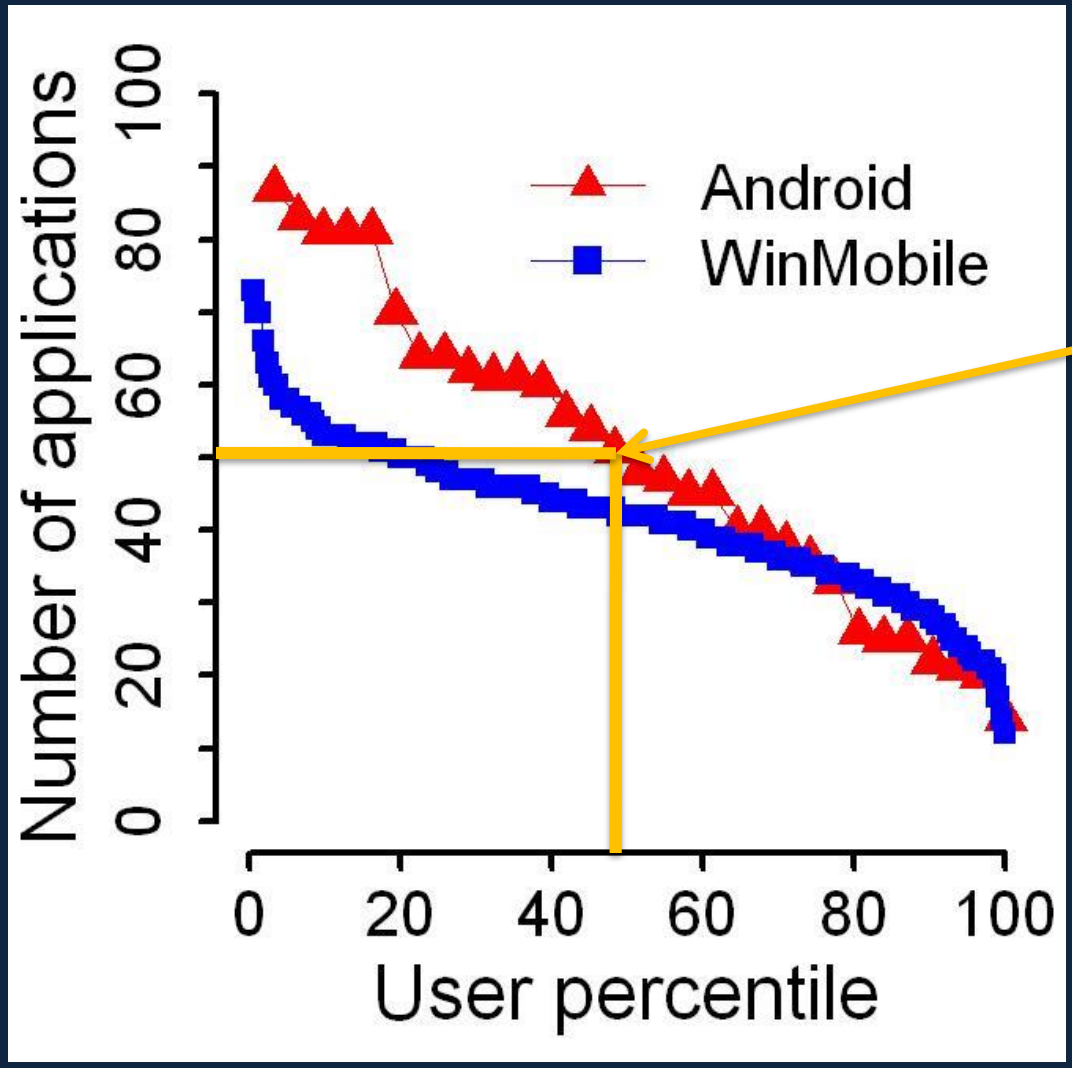
Non-linear battery effects can be ignored

High diversity across users



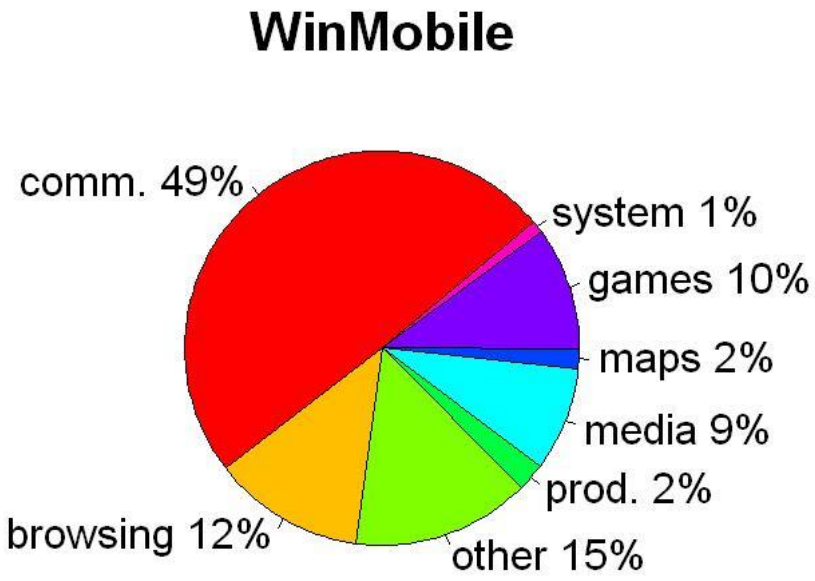
Diversity in smartphone usage
MobiSys 2010

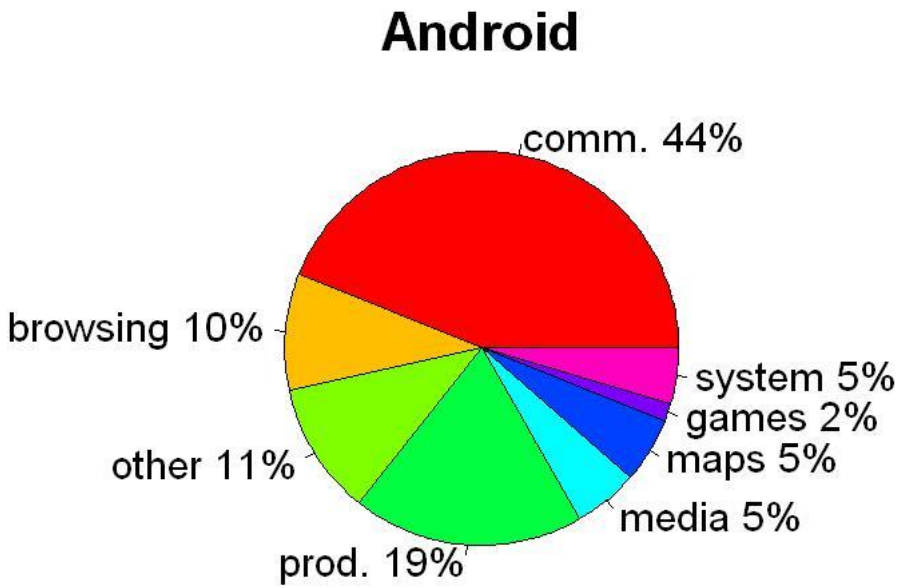
Number of apps used is high



50% of users run more than 50 apps

Time spent on different app types





Traffic generated by different app types

	Bytes (%)
Browsing	58.02
Media	10.82
Messaging (Email, IM)	10.33
Maps	8.51
System	5.83
Social networking	4.18
Games	0.36
Productivity	0.15
unknown/other	1.79

A first look at traffic on smartphones
IMC 2010

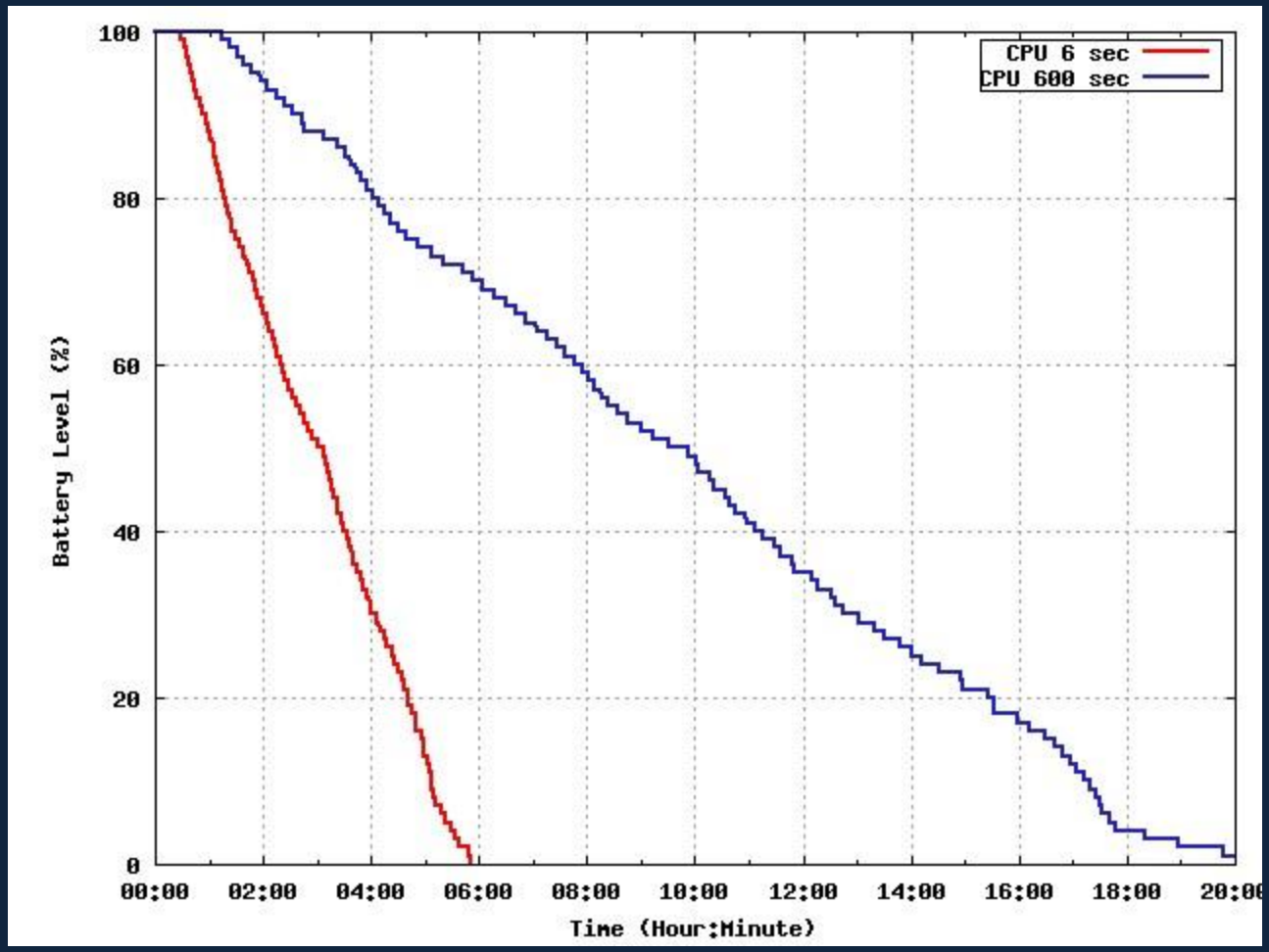
Energy hungry hardware devices

Top 4

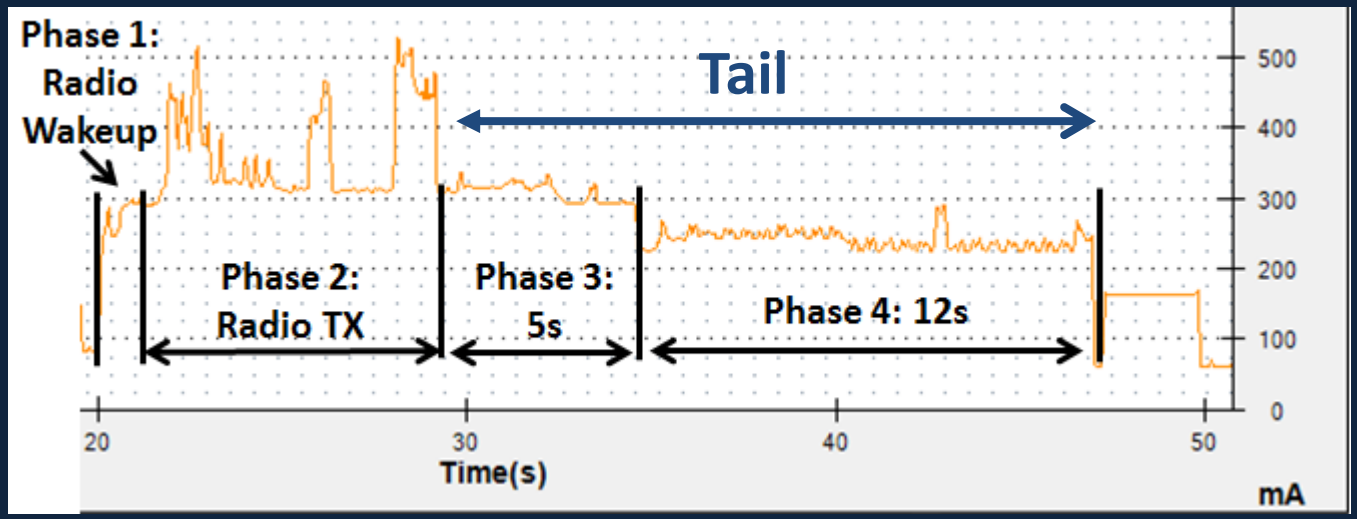
1. Screen
2. CPU
3. Memory
4. Radio

GPS is expensive but not always on

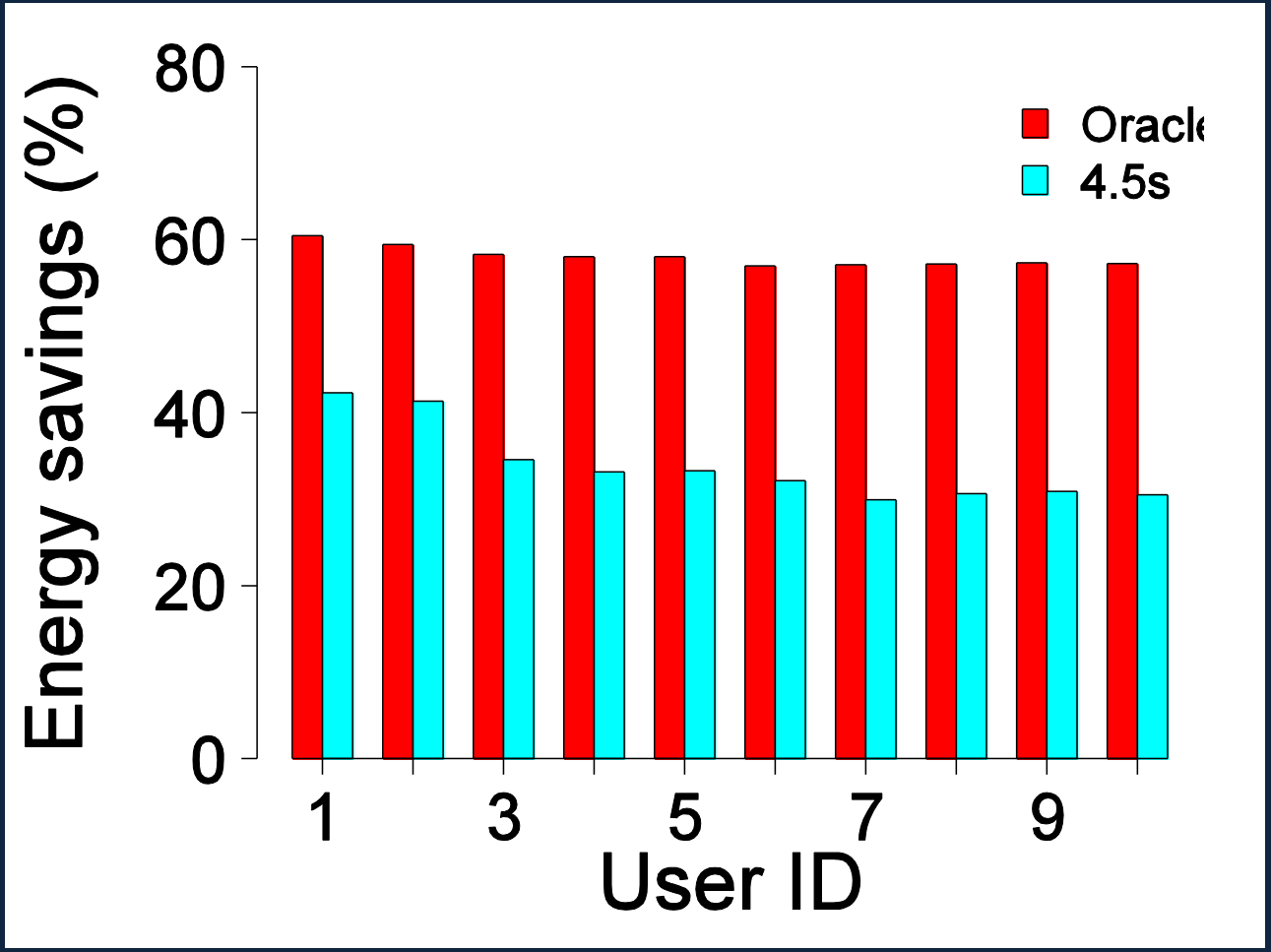
CPU energy use depends on how its used



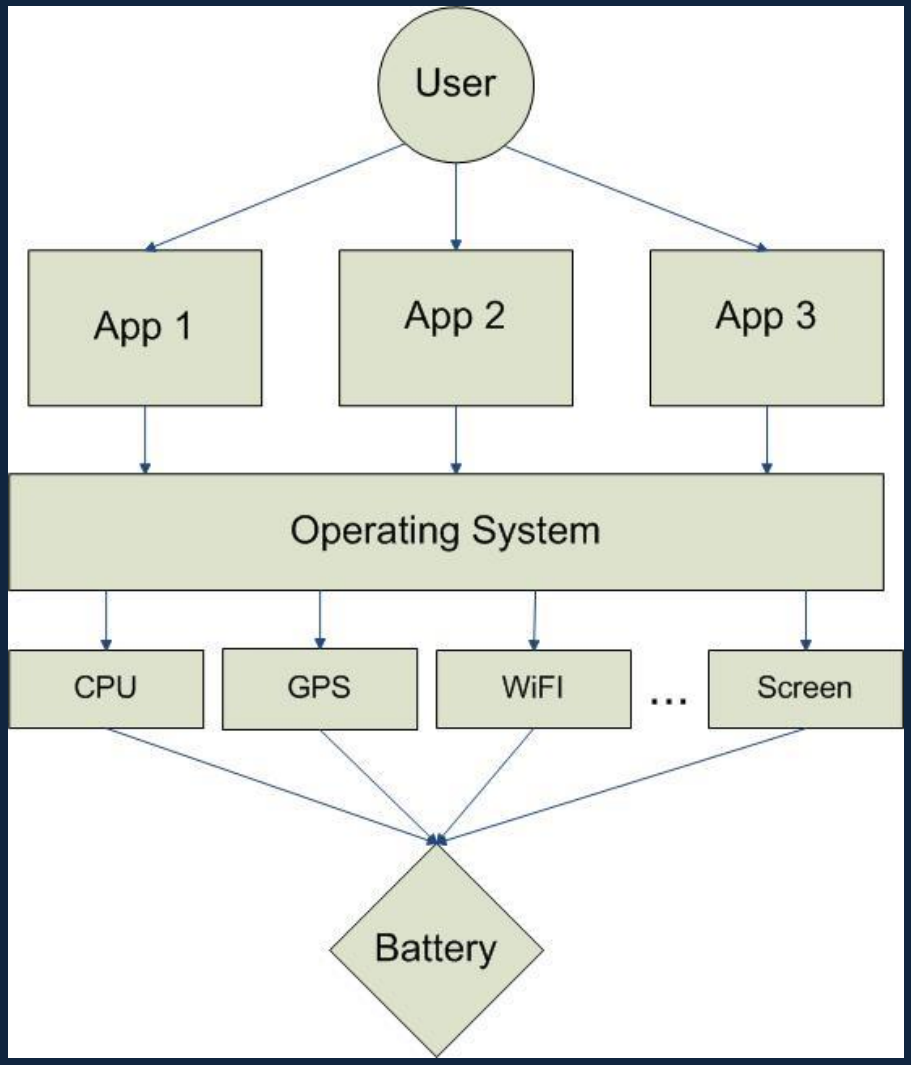
Behavior of 3G radio



Savings from reducing tail length



Summary



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