

# Viewing Battery Use Data

The `dumpsys batterystats` command generates interesting statistical data about battery usage on a device, organized by unique user ID (UID). The statistics include the following:

- History of battery-related events
- Global statistics for the device
- Approximate power use per UID and system component
- Per-app mobile milliseconds per packet
- System UID aggregated statistics
- App UID aggregated statistics

Use the [Battery Historian](https://github.com/google/battery-historian) (<https://github.com/google/battery-historian>) tool on the output of the `dumpsys` command to generate an HTML visualization of power-related events from the logs. This information makes it easier to understand and diagnose battery-related issues.

## Command input

The basic `batterystats` command is:

```
$ adb shell dumpsys batterystats
```

Supported options:

- `--help` displays additional options for tailoring the output.
- `--checkin` exports results in machine-readable csv format.

For example, to print battery usage statistics in csv format for all apps since the device was last charged, run the command:

```
$ adb shell dumpsys batterystats --charged --checkin
```

You can also specify a package name to get statistics for a single app. For example, to print battery usage statistics for a given app package since the device was last charged, run the command:

```
$ adb shell dumpsys batterystats --charged <package-name>
```

## Command output

The `batterystats` command generates aggregated observations about battery use on the device since it was last charged. Observations may be per-UID or system-level; data is selected for inclusion based on its usefulness in analyzing battery performance. Output includes one (1) entry per observation, and each entry consists of a comma-separated list of values in the format: *int,uid,mode,section,fields* (one or more).

The first four values correspond to the following:

- Dummy integer
- UID
- Aggregation mode
  - "i" for information not tied to charged/uncharged status.
  - "l" for `--charged` (usage since last charge).
  - "u" for `--unplugged` (usage since last unplugged). Deprecated in Android 5.1.1.
- Section identifier (`#interpreting_the_output`), which determines how to interpret subsequent values in the line.

Sample output:

```
9,0,i,vers,11,116,K,L 9,0,i,uid,1000,android
9,0,i,uid,1000,com.android.providers.settings
```

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```
9,0,1,kwl,sns_async_ev_wakelock,91954,1244 9,0,1,kwl,qmuxd_port_wl_12,0,0
9,0,1,kwl,pil-wcnss,0,0 9,0,1,kwl,event0-648,11364,1212
9,0,1,kwl,dofstrim,0,0 9,0,1,kwl,ssr(lpass),0,0
9,0,1,kwl,qmuxd_port_wl_11,0,0 9,0,1,kwl,event2-648,0,0
9,0,1,kwl,pil-vidc,0,0 9,0,1,kwl,mmc0,0,0
9,0,1,kwl,tabla_gpio_irq_resend,0,0 9,0,1,kwl,pil-q6,0,0
9,0,1,kwl,radio-interface,0,0 9,0,1,kwl,msm_ipc_read00000001:00000002,0,0
9,0,1,kwl,event3-648,8143,1231 9,0,1,kwl,ssr(wcnss),0,0
9,0,1,kwl,ssr(gss),0,0 9,0,1,kwl,KeyEvents,98,1263
9,0,1,kwl,unknown_wakeups,0,0 9,0,1,kwl,qmuxd_port_wl_10,0,0
9,0,1,kwl,pil-gss,0,0 9,0,1,kwl,qcom_rx_wakelock,161828,3205
9,0,1,kwl,ssr(external_modem),0,0 9,0,1,kwl,power-supply,228,23
9,0,1,kwl,pil-dsps,0,0 9,0,1,kwl,wcnss,0,0 9,0,1,kwl,msm_otg,0,0
9,0,1,kwl,pm8921_eoc,0,0 9,0,1,kwl,slimport_wake_lock,0,0
9,0,1,kwl,smsm_snapshot,0,0 9,0,1,kwl,suspend_backoff,239760,24
9,0,1,kwl,event1-648,9331,1212 9,0,1,kwl,main,429,0
9,0,1,kwl,alarm,2892,270 9,0,1,kwl,PowerManagerService.Display,432,1
9,0,1,kwl,qmi1,0,0 9,0,1,kwl,kickstart,211,1
9,0,1,kwl,qmuxd_port_wl_9,9,102 9,0,1,kwl,ear_hook,0,0
9,0,1,kwl,mmc0_detect,52,1232 9,0,1,kwl,deleted_wake_locks,0,0
9,0,1,kwl,PowerManagerService.Broadcasts,7331,0 9,0,1,kwl,qmi2,0,0
9,0,1,kwl,smd_sns_dsps,456,1340 9,0,1,kwl,alarm_rtc,36084,122
9,0,1,pws,2100,64.4,42.0,63.0 9,10009,l,pwi,uid,20.6 9,0,1,pwi,cell,18.5
9,0,1,pwi,idle,8.73 9,0,1,pwi,uid,5.46 9,1000,l,pwi,uid,5.11
9,0,1,pwi,wifi,3.28 9,10019,l,pwi,uid,0.847 9,10069,l,pwi,uid,0.408
9,0,1,pwi,scrn,0.385 9,10034,l,pwi,uid,0.322 9,10025,l,pwi,uid,0.185
9,0,1,pwi,blue,0.0273
9,0,1,pwi,cell,14.0
9,10002,l,pwi,uid,0.180 9,10023,l,pwi,uid,0.168 9,1001,l,pwi,uid,0.0297
9,10068,l,pwi,uid,0.0296 9,10057,l,pwi,uid,0.0234 9,1027,l,pwi,uid,0.0157
9,10079,l,pwi,uid,0.00905 9,10054,l,pwi,uid,0.00527
9,10005,l,pwi,uid,0.00341 9,10004,l,pwi,uid,0.00204
9,2000,l,pwi,uid,0.00192 9,10070,l,pwi,uid,0.00144
9,10061,l,pwi,uid,0.000860 9,10014,l,pwi,uid,0.000495
9,10040,l,pwi,uid,0.000286 9,1014,l,pwi,uid,0.0000157 9,0,1,pwi,over,1.36
9,0,1,nt,0,0,127699,11159,0,0,975,163,0,0
9,0,1,pr,file-storage,0,140,0,0,0,0 9,0,1,pr,TX_Thread,0,440,0,0,0,0
9,0,1,pr,flush-179:0,0,850,0,0,0,0 9,0,1,pr,sync_supers,10,0,0,0,0,0
9,0,1,pr,dhpcpd,0,30,0,0,0,0 9,0,1,pr,kauditd,50,10,0,0,0,0
9,0,1,pr,sdcard,20,110,0,0,0,0 9,0,1,pr,flush-0:18,40,100,0,0,0,0
9,0,1,pr,zygote,250,90,0,0,0,0 9,0,1,pr,bdi-default,0,610,0,0,0,0
9,0,1,pr,ueventd,940,2630,0,0,0,0 9,0,1,pr,kswapd0,0,180,0,0,0,0
9,0,1,pr,debuggerd,180,610,0,0,0,0 9,0,1,pr,jbd2/mmcblk0p20,0,50,0,0,0,0
9,0,1,pr,jbd2/mmcblk0p21,0,250,0,0,0,0
9,0,1,pr,jbd2/mmcblk0p22,0,90,0,0,0,0
9,0,1,pr,jbd2/mmcblk0p23,0,1150,0,0,0,0 9,0,1,pr,MC_Thread,0,1270,0,0,0,0
9,0,1,pr,adbd,10,40,0,0,0,0 9,0,1,pr,lmkd,360,990,0,0,0,0
9,0,1,pr,logd,1550,1670,0,0,0,0 9,0,1,pr,netd,80,330,0,0,0,0
9,0,1,pr,rild,160,0,0,0,0,0 9,0,1,pr,vold,50,100,0,0,0,0
9,0,1,pr,/init,0,70,0,0,0,0 9,0,1,pr,mpdecision,1400,7820,0,0,0,0
9,0,1,pr,khubd,0,10,0,0,0,0 9,0,1,pr,kthreadd,0,600,0,0,0,0
9,0,1,pr,kworker/0:0,0,3520,0,0,0,0 9,0,1,pr,sensors.qcom,380,720,0,0,0,0
9,0,1,pr,healthd,20,190,0,0,0,0 9,0,1,pr,thermald,60,360,0,0,0,0
9,0,1,pr,mmcqd/0,0,8700,0,0,0,0 9,0,1,pr,qseecomd,0,90,0,0,0,0
9,0,1,pr,ksoftirqd/0,0,420,0,0,0,0 9,0,1,pr,wpa_suplicant,170,160,0,0,0,0
9,0,1,pr,migration/0,0,1630,0,0,0,0 9,0,1,pr,migration/1,20,0,0,0,0,0
9,0,1,pr,RX_Thread,0,790,0,0,0,0 9,0,1,pr,netmgrd,40,20,0,0,0,0
9,1000,l,nt,0,0,11054,11216,0,0,26,29,0,0 9,1000,l,ua,2,0,0
9,1000,l,sr,5,6813,1 9,1000,l,wl,*alarm*,0,f,0,23856,p,151,0,w,0
9,1000,l,st,8548446,8548446,8548446 9,1000,l,pr,system,83310,35060,0,0,0,0
9,1000,l,pr,surfaceflinger,6620,9330,0,0,0,0 9,1000,l,pr,ks,0,60,0,0,0,0
9,1000,l,pr,qcks,0,90,0,0,0,0 9,1000,l,pr,efsk,0,50,0,0,0,0
9,1000,l,pr,com.android.server.telecom,110,100,0,0,0,0
9,1000,l,pr,servicemanager,40,110,0,0,0,0
9,1001,l,st,8548446,8548446,8548446 9,1001,l,pr,qmuxd,0,30,0,0,0,0
9,1001,l,pr,com.android.phone,450,300,0,0,0,0
9,1014,l,nt,0,0,3410,3370,0,0,10,10,0,0 9,1027,l,st,8548446,8548446,8548446
9,1027,l,pr,com.android.nfc,250,160,0,0,0,0
9,10002,l,apk,15,com.android.providers.calendar,com.android.providers.calendar.CalendarProviderIntentService,2383,1
9,10005,l,nt,0,0,1241,2488,0,0,6,10,0,0
9,10009,l,nt,0,0,232255,258511,0,0,472,600,0,0
9,10009,l,wf1,7689000,9814000,0
```

```
9,10009,1,jb,com.google.android.gms/.gcm.nts.TaskExecutionService,81,3
9,10009,1,sr,0,43643,46 9,10025,1,nt,0,0,152461,42850,0,0,267,243,0,0
9,10025,1,wf1,1593000,629000,0 9,10034,1,nt,0,0,77657,40093,0,0,172,170,0,0
9,10068,1,nt,0,0,11929,8383,0,0,50,47,0,0
9,10069,1,nt,0,0,41553,22886,0,0,85,91,0,0
```

## Section identifiers

Command output for `batterystats` supports the following sections:

Section Identifier	Description	Remaining Fields
vers	Version	checkin version, parcel version, start platform version, end platform version
uid	UID	uid, package name
apk	APK	wakeups, APK, service, start time, starts, launches
pr	Process	process, user, system, foreground, starts
sr	Sensor	sensor number, time, count
vib	Vibrator	time, count
fg	Foreground	time, count
st	State Time	foreground, active, running
wl	Wake lock	wake lock, full time, 'f', full count, partial time, 'p', partial count, window time, 'w', window count
sy	Sync	sync, time, count
jb	Job	job, time, count
kwl	Kernel Wake Lock	kernel wake lock, time, count
wr	Wakeup Reason	wakeup reason, time, count
nt	Network	mobile bytes RX, mobile bytes TX, Wi-Fi bytes RX, Wi-Fi bytes TX, mobile packets RX, mobile packets TX, Wi-Fi packets RX, Wi-Fi packets TX, mobile active time, mobile active count
ua	User Activity	other, button, touch
bt	Battery	start count, battery realtime, battery uptime, total realtime, total uptime, start clock time, battery screen off realtime, battery screen off uptime
dc	Battery Discharge	low, high, screen on, screen off
lv	Battery Level	start level, current level
wfl	Wi-Fi	full Wi-Fi lock on time, Wi-Fi scan time, Wi-Fi running time, Wi-Fi scan count, Wi-Fi idle time, Wi-Fi receive time, Wi-Fi transmit time
gwfl	Global Wi-Fi	Wi-Fi on time, Wi-Fi running time, Wi-Fi idle time, Wi-Fi receive time, Wi-Fi transmit time, Wi-Fi power (mAh)
gble	Global Bluetooth	BT idle time, BT receive time, BT transmit time, BT power (mAh)
m	Misc	screen on time, phone on time, full wakelock time total, partial wakelock time total, mobile radio active time, mobile radio active adjusted time, interactive time, power save mode enabled time, connectivity changes, device idle mode enabled time, device idle mode enabled count, device idling time, device idling count, mobile radio active count, mobile radio active unknown time
gn	Global Network	mobile RX total bytes, mobile TX total bytes, Wi-Fi RX total bytes, Wi-Fi TX total bytes, mobile RX total packets, mobile TX total packets, Wi-Fi RX total packets, Wi-Fi TX total packets
br	Screen Brightness	dark, dim, medium, light, bright
sst	Signal Scanning Time	signal scanning time
sgt	Signal Strength Time	none, poor, moderate, good, great
sgc	Signal Strength Count	none, poor, moderate, good, great

dct	Data Connection Time	none, GPRS, EDGE, UMTS, CDMA, EVDO_0, EVDO_A, 1xRTT, HSDPA, HSUPA, HSPA, IDEN, EVDO_B, LTE, EHRPD, HSPAP, other
dcc	Data Connection Count	none, GPRS, EDGE, UMTS, CDMA, EVDO_0, EVDO_A, 1xRTT, HSDPA, HSUPA, HSPA, IDEN, EVDO_B, LTE, EHRPD, HSPAP, other
wst	Wi-Fi State Time	off, off scanning, on no networks, on disconnected, on connected STA, on connected P2P, on connected STA P2P, soft AP
wsc	Wi-Fi State Count	off, off scanning, on no networks, on disconnected, on connected STA, on connected P2P, on connected STA P2P, soft AP
wsst	Wi-Fi Supplicant State Time	invalid, disconnected, interface disabled, inactive, scanning, authenticating, associating, associated, four-way handshake, group handshake, completed, dormant, uninitialized
wssc	Wi-Fi Supplicant State Count	invalid, disconnected, interface disabled, inactive, scanning, authenticating, associating, associated, four-way handshake, group handshake, completed, dormant, uninitialized
wsgt	Wi-Fi Signal Strength Time	none, poor, moderate, good, great
wsgc	Wi-Fi Signal Strength Count	none, poor, moderate, good, great
bst	Bluetooth State Time	inactive, low, med, high
bsc	Bluetooth State Count	inactive, low, med, high
pws	Power Use Summary	battery capacity, computed power, minimum drained power, maximum drained power
pwi	Power Use Item	label, mAh
dsd	Discharge Step	duration, level, screen, power-save
csd	Charge Step	duration, level, screen, power-save
dtr	Discharge Time Remaining	battery time remaining
ctr	Charge Time Remaining	charge time remaining

## Bluetooth, cellular, and Wi-Fi usage

Support for battery usage data on Bluetooth, cellular, and Wi-Fi data requires the device Bluetooth, cellular, and Wif-Fi chipsets implement radio support and the chipset firmware passes usage data to the framework. OEMs must work with their chipset providers to facilitate in-field firmware updates on existing chipsets and compatible firmware on new chipsets.

Additionally, OEMs must continue to configure and submit the power profile for their devices. However, when the platform detects that Bluetooth, cellular (as of Android 7.0), or Wi-Fi radio power data is available from the chipset, it uses chipset data instead of power profile data. For details, see [Power values](https://source.android.com/devices/tech/power/values.html#values) (https://source.android.com/devices/tech/power/values.html#values).

**Note:** Prior to Android 6.0, power use for Bluetooth radio, cellular radio, and Wi-Fi was tracked in the *m* (Misc) section category. In Android 6.0 and higher, power use for these components is tracked in the *pwi* (Power Use Item) section with individual labels (*wifi*, *blue*, *cell*) for each component.

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