WHO WATCHES THE SMART WATCHES?

Brian Moran

Digital Strategy Consultant - BriMor Labs

Millersville, Maryland

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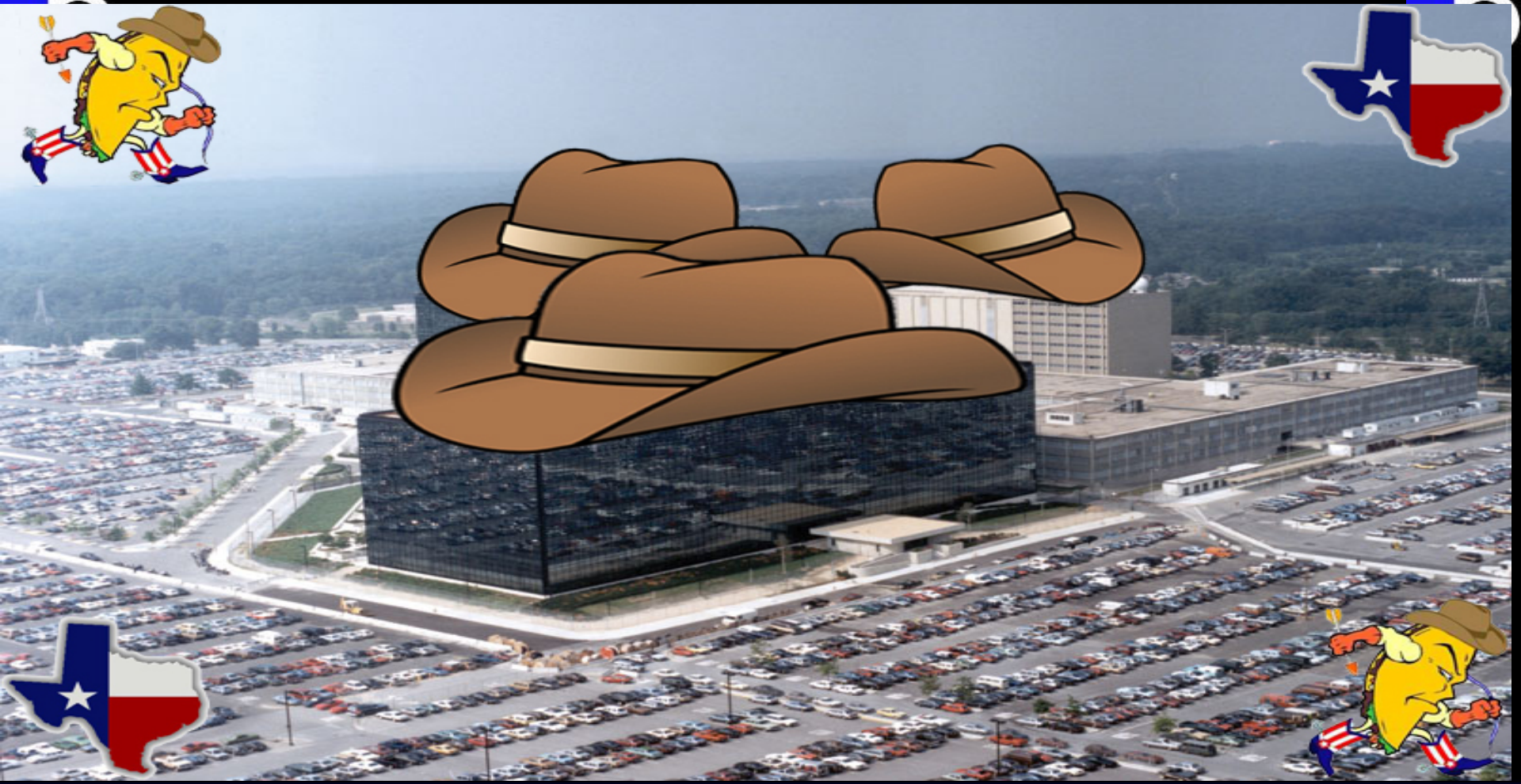
A Brief List of Topics

- Why use these confounded devices?
- Pebble Time
- UA Band
- Ways to protect your data
- Future research goals
- Q & A

The Introductory Introduction

- Hello, my name is Brian Moran
  - Hi Brian!
- 13 years Air Force Active Duty
  - 10 years mobile exploitation/DFIR experience
- Worked here….



Hardware Used

- Samsung Galaxy Note II (SCH-i605) – rooted
  - Running Android 4.4.2
- Pebble Time
  - Running 3.10
- UA Band
  - Running 1.17.1.14
- Microsoft Band 2
  - Running 2.0.4215.0 26R

The Microsoft Band is dead

Microsoft has ended sales of its fitness wearable

by Chris Welch · @chriswelch · Oct 3, 2016, 3:02p

NEW TRENDING STORIES

The Pixel phone is exactly what we wanted, so of course we're unhappy

Sad day on October 3, 2016

- Microsoft announced it was ending sales of the Band 2
  - SDK also removed
  - “No current plans for Band 3”

- Rather than cover a portion of my talk on (now) legacy hardware, purchased a UA Band to research same information
  - Only had a few weeks of data & research, there is definitely more to come!

But some good news for you

- The offline version of this presentation will also include the Band 2 slides
  - In case you encounter a Band 2 or were curious about it

- This presentation, however, will NOT cover the Band 2 at all

Software Used

- ES File Explorer app – Android
  - Version 4.0.4.5
- Pebble Time app – Android
  - Version 3.10.0-976-0c219e8
- UA Record app – Android
  - Version 3.9.0.1
- SQLite Spy
  - Version 1.9.6
- Hex Workshop
  - Version 6.8.0.5419
- Perl/Python

iOS data shout out

- Special thanks to likely 2017 Forensic 4Cast Awards "Digital Forensic Book of the Year" nominee Heather Mahalik for providing me Pebble related iOS data*
  - Let's make this happen!

*Only cost me a couple pairs of LuLaRoe leggings & some Middleswarth chips


Heather Mahalik
Heather Mahalik
smarterforensics.com
Forensicating for us
Heather 2017

What Was NOT Used

- Cellebrite *(This is the Open Source Digital Forensics Conference)*
- During the course of this research, no lying dormant cyber pathogens were harmed

Why not Apple/Samsung/LG/etc.?

- Wanted to choose smartwatches that can be used regardless of brand of phone or phone operating system

- Pebble – Android, iOS, “unofficial official” Windows Phone
- UA Band – Android, iOS

Why use smart watches?

- Helpful notifications (especially when driving)

Peacock Leprechaun

..and you thought combining sharks and tornados was bad!!

Peacock Leprechaun

..and you thought combining sharks and tornados was bad!!

Why use smart watches?

- Fitness/workout tracking

Why use smart watches?

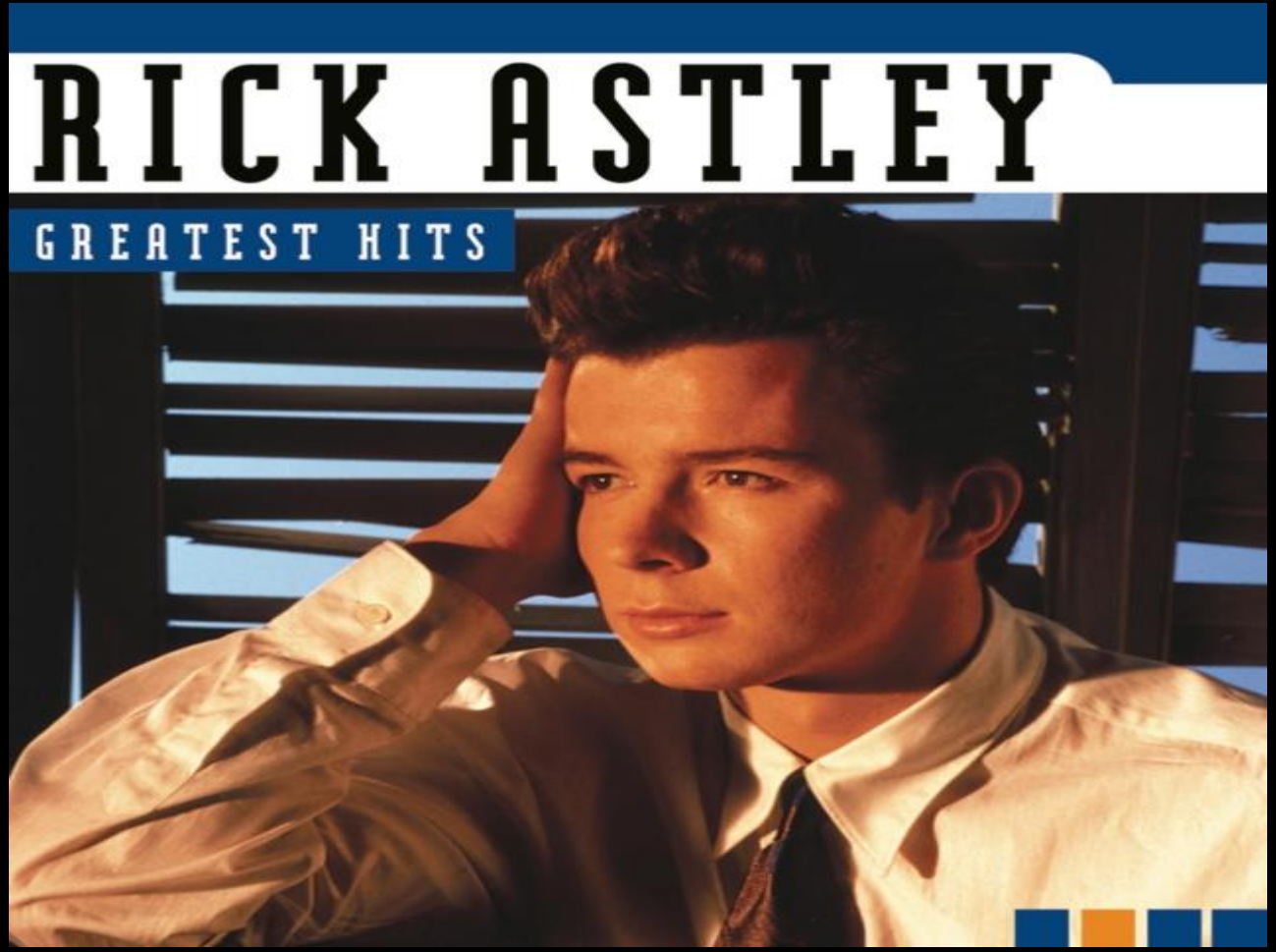
Inactive and out of shape

What’s the matter? The CIA got you pushing too many pencils?

Tracking a weekend bike ride

Tracking a round of golf

Tracking your run



Remotely change music from this …


ORIGINAL MOTION PICTURE SOUNDTRACK
MUSIC BY CHRIS RIDENHOUR AND CHRISTOPHER CANO
SHARKNADO 2
THE SECOND ONE

... to this

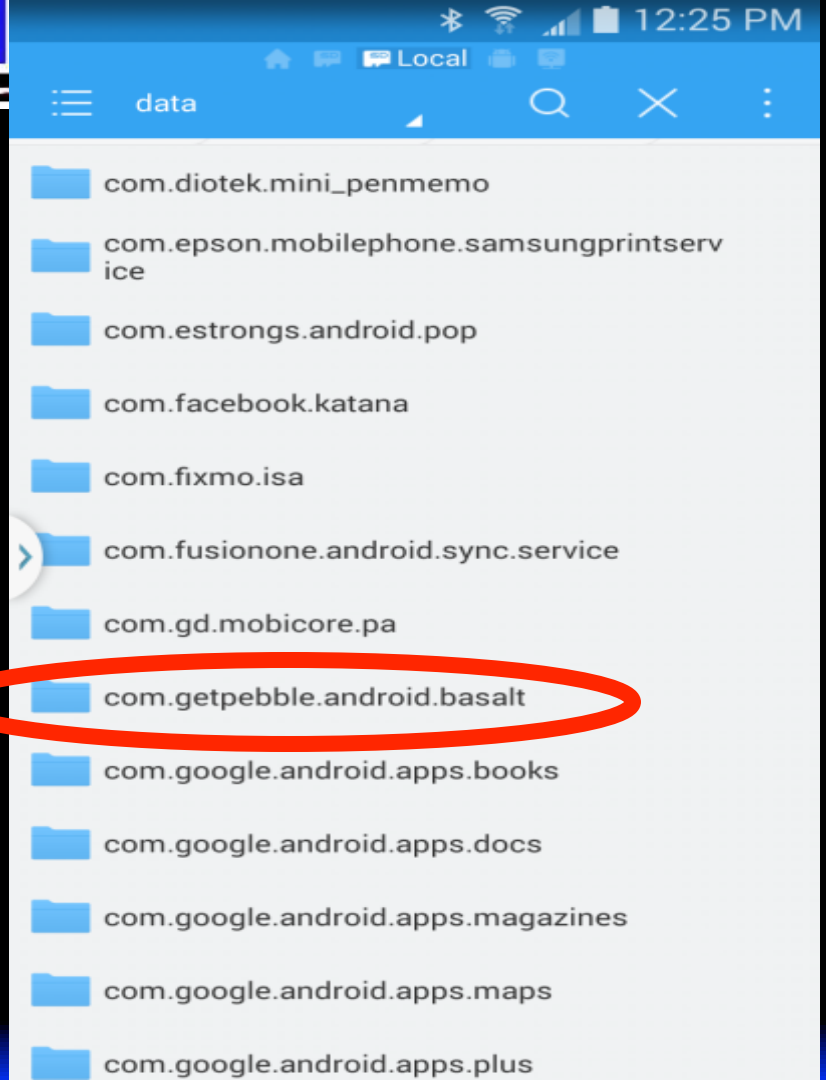
Tracking your sleep

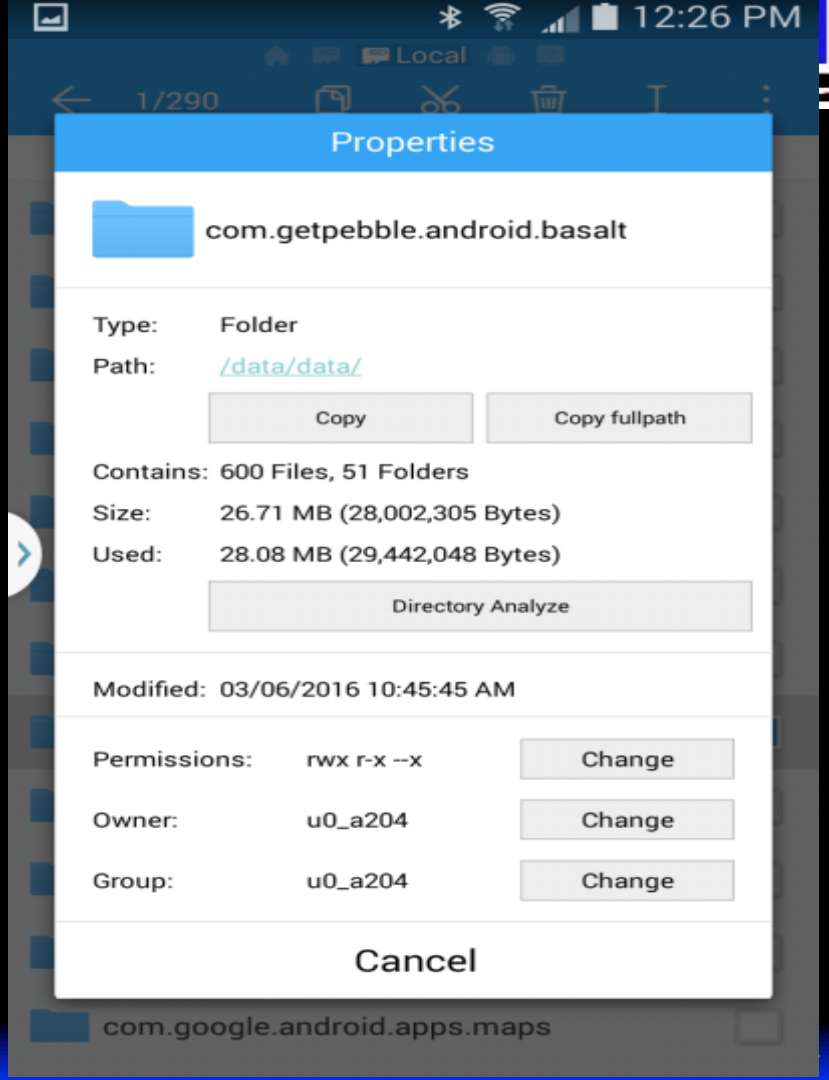
Pebble Time Specs

- **Processor:** ST Micro STM32F439ZG 180 MHz ARM Cortex-M4-based-MCU (100 MHz, single core)
- **Storage:** Spansion S29VS128R 128MB, 65 nm MirrorBit Flash
- **Display:** 1.25” color e-paper screen (144 x 168 pixels, 182 ppi)
- **Battery:** 150 mAh, (average battery life of 7 days)
- **Bluetooth:** TBD
- Source: *https://www.ifixit.com/Teardown/Pebble+Time+Teardown/42382*

Pebble Time storage (Android mobile device)

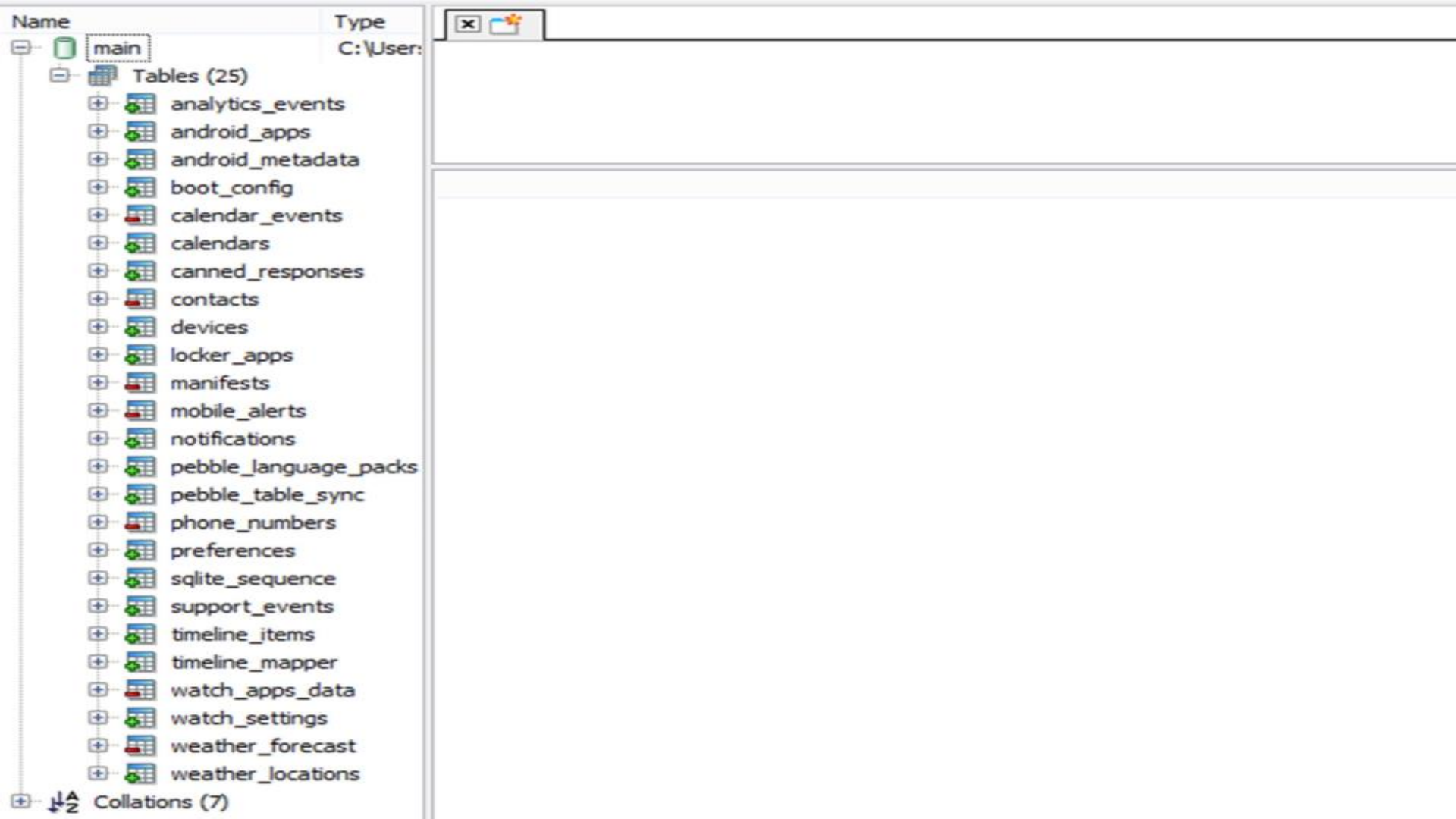
- Path: /data/data/com.getpebble.android.basalt
  - Make sure it is NOT “emulated”


12:25 PM
Local
data
com.diotek.mini_penmemo
com.epson.mobilephone.samsungprintservice
com.estrongs.android.pop
com.facebook.katana
com.fixmo.isa
com.fusionone.android.sync.service
com.gd.mobicore.pa
com.getpebble.android.basalt
com.google.android.apps.books
com.google.android.apps.docs
com.google.android.apps.magazines
com.google.android.apps.maps
com.google.android.apps.plus


12:26 PM
Local
1/290
Properties
com.getpebble.android.basalt
Type: Folder
Path: /data/data/
Copy
Copy fullpath
Contains: 600 Files, 51 Folders
Size: 26.71 MB (28,002,305 Bytes)
Used: 28.08 MB (29,442,048 Bytes)
Directory Analyze
Modified: 03/06/2016 10:45:45 AM
Permissions: rwx r-x --x
Change
Owner: u0_a204
Change
Group: u0_a204
Change
Cancel
com.google.android.apps.maps

Pebble Time storage (Android mobile device)

- “data\data\com.getpebble.android.basalt \databases\pebble” is primary file of interest
  - SQLite database (as are most files on mobile devices these days)
  - Easy to view in any SQLite viewer or parse via scripting languages


Name
Type
main
C:\User:
Tables (25)
analytics_events
android_apps
android_metadata
boot_config
calendar_events
calendars
canned_responses
contacts
devices
locker_apps
manifests
mobile_alerts
notifications
pebble_language_packs
pebble_table_sync
phone_numbers
preferences
sqlite_sequence
support_events
timeline_items
timeline_mapper
watch_apps_data
watch_settings
weather_forecast
weather_locations
Collations (7)

Pebble Time storage (Android mobile device)

- Table “android_apps” contains a listing of every application and application version installed on the device
- Information is obviously needed for notifications sent to Pebble
- Useful location if looking for an application/version

_nee...	_nee...	_date_updated	app_version	is_sy...	chosen	allowed	mute...	notifi...	package_name	_date_created	last_notified_...	app_name	_is_d...	_id
0	0	2016-03-03 22:47:04	0	1	1	1	0	0	pbl_phone_calls	2016-03-03 22:47:04	1457045224574	Phone Calls		1
0	0	2016-03-03 22:47:04	2.2.0	0	1	1	0	0	com.audible.application	2016-03-03 22:47:04	0	Audible		2
0	0	2016-03-03 22:47:05	4.4.2-I605VRUFND7	0	1	1	0	0	com.sec.android.gallery3d	2016-03-03 22:47:05	0	Gallery		3
0	0	2016-03-03 22:47:05	13.0.7	0	1	1	0	0	com.gotv.nflgamecenter.us.lite	2016-03-03 22:47:05	0	NFL Mobile		4
0	0	2016-03-03 22:47:05	11.2.2.0	0	1	1	0	0	com.vlingo.midas	2016-03-03 22:47:05	0	S Voice		5
0	0	2016-03-03 22:47:05	4.4.2-I605VRUFND7	0	1	1	0	0	com.android.browser	2016-03-03 22:47:05	0	Internet		6
0	0	2016-03-03 22:47:05	2.0.12	0	1	1	0	0	com.sec.penup	2016-03-03 22:47:05	0	PEN.UP		7
0	0	2016-03-03 22:47:05	5r25466FV03	0	1	1	0	0	com.sec.android.app.snotebook	2016-03-03 22:47:05	0	S Note		8
0	0	2016-03-03 22:47:05	4.4.2-I605VRUFND7	0	0	1	0	0	com.android.providers.downloads.ui	2016-03-03 22:47:05	0	Downloads		9
0	0	2016-03-03 22:47:05	4.4.2-I605VRUFND7	0	1	1	0	0	com.android.mms	2016-03-03 22:47:05	1457111555888	Messaging		10
0	0	2016-03-03 22:47:05	release-7.5002.491.1C_637500210	0	1	1	0	0	com.amazon.venezia	2016-03-03 22:47:05	0	Appstore		11
0	0	2016-03-03 22:47:05	4.0.3404.02	0	1	1	0	0	com.infraware.polarisoffice4	2016-03-03 22:47:05	0	Polaris Office 4.0		12
0	0	2016-03-03 22:47:05	4.4.2-I605VRUFND7	0	0	1	0	0	com.android.settings	2016-03-03 22:47:05	0	Settings		13
0	0	2016-03-03 22:47:05	4.21.0.65	0	1	1	0	0	com.amazon.kindle	2016-03-03 22:47:05	0	Amazon Kindle		14
0	0	2016-03-03 22:47:05	1.8.2135	0	1	1	0	0	com.sec.pcw	2016-03-03 22:47:05	0	Samsung Link		15
0	0	2016-03-03 22:47:06	5.9.33.19.arm	0	0	1	0	0	com.google.android.googlequicksearchbox	2016-03-03 22:47:06	0	Google App		16
0	0	2016-03-03 22:47:06	2.5.410	0	1	1	0	0	com.samsung.groupcast	2016-03-03 22:47:06	0	Group Play		17
0	0	2016-03-03 22:47:06	2.3.583.20.34	0	1	1	0	0	com.google.android.apps.docs	2016-03-03 22:47:06	0	Drive		19
0	0	2016-03-03 22:47:06	3.10.0-976-0c219e8	0	1	1	0	0	com.getpebble.android.basalt	2016-03-03 22:47:06	0	Pebble Time		20
0	0	2016-03-03 22:47:06	5.2.1	0	1	1	0	0	com.amazon.mp3	2016-03-03 22:47:06	0	Amazon Music		21
0	0	2016-03-03 22:47:06	3.3.49	0	1	1	0	0	com.tgrape.android.radar	2016-03-03 22:47:06	0	S Suggest		22
0	0	2016-03-03 22:47:06	3.12.10	0	1	1	0	0	com.google.android.videos	2016-03-03 22:47:06	0	Google Play Movies & TV		23
0	0	2016-03-03 22:47:06	5.2.5	0	1	1	0	0	com.vzw.hs.android.modlite	2016-03-03 22:47:06	0	Verizon Tones		24
0	0	2016-03-03 22:47:06	3.0.640660	0	1	1	0	0	com.sec.android.app.popupcalculator	2016-03-03 22:47:06	0	Calculator		25
0	0	2016-03-03 22:47:06	1.0	0	1	1	0	0	com.sec.android.app.setupwizard	2016-03-03 22:47:06	0	Setup Wizard		26
0	0	2016-03-03 22:47:06	7.3.0.115084102	0	1	1	0	0	com.google.android.apps.plus	2016-03-03 22:47:06	0	Google+		27
0	0	2016-03-03 22:47:06	6.0.5	0	0	1	0	0	com.android.vending	2016-03-03 22:47:06	1457546066679	Google Play Store		28
0	0	2016-03-03 22:47:07	9.0.6.123	0	1	1	0	0	com.vznavigator.SCHI605	2016-03-03 22:47:07	0	VZ Navigator		29
0	0	2016-03-03 22:47:07	14031102.1.30.01	0	1	1	0	0	com.sec.everglades	2016-03-03 22:47:07	0	Samsung Hub		30
0	0	2016-03-03 22:47:07	3.5.1	0	1	1	0	0	com.google.android.apps.magazines	2016-03-03 22:47:07	0	Google Play Newsstand		31
0	0	2016-03-03 22:47:07	6.0.1	0	1	1	0	0	com.sec.android.app.music	2016-03-03 22:47:07	0	Music		32
0	0	2016-03-03 22:47:07	1.3.20213.1	0	1	1	0	0	com.microsoft.kapp	2016-03-03 22:47:07	0	Microsoft Health		33
0	0	2016-03-03 22:47:07	0.1	0	1	1	0	0	com.sec.android.app.voicerecorder	2016-03-03 22:47:07	0	Voice Recorder		34
0	0	2016-03-03 22:47:07	6.1.0.106100200	0	1	1	0	0	com.imdb.mobile	2016-03-03 22:47:07	0	IMDb		35
0	0	2016-03-03 22:47:07	4.4.2-I605VRUFND7	0	1	1	0	0	com.android.contacts	2016-03-03 22:47:07	0	Contacts		36
0	0	2016-03-03 22:47:07	A.01.011802V	0	1	1	0	0	com.samsung.everglades.video	2016-03-03 22:47:07	0	Video		37
0	0	2016-03-03 22:47:07	1.4.48	0	1	1	0	0	com.dama.paperartist	2016-03-03 22:47:07	0	Paper Artist		38
0	0	2016-03-03 22:47:07	4.4.2-I605VRUFND7	0	0	0	0	0	com.android.calendar	2016-03-03 22:47:07	1457454120495	Calendar		39
0	0	2016-03-03 22:47:07	8.4.89 (2428711-036)	0	0	1	0	0	com.google.android.gms	2016-03-03 22:47:07	0	Google Play services		40
0	0	2016-03-03 22:47:07	11.1.15	0	1	1	0	0	com.vzw.hss.myverizon	2016-03-03 22:47:07	1457444942184	My Verizon Mobile		41
0	0	2016-03-03 22:47:07	2.4.00	0	1	1	0	0	com.samsung.vvm	2016-03-03 22:47:07	0	Voicemail		42
0	0	2016-03-03 22:47:07	6.4.2417W.2625988	0	0	1	0	0	com.google.android.music	2016-03-03 22:47:07	0	Google Play Music		44
0	0	2016-03-03 22:47:07	1.0	0	1	1	0	0	com.samsung.helphub	2016-03-03 22:47:07	0	Help		45
0	0	2016-03-03 22:47:07	4.4.2.0200	0	1	1	0	0	com.android.email	2016-03-03 22:47:07	0	Email		46

Pebble Time storage (Android mobile device)

- Table “notifications” contains a listing of every notification that happened on the mobile device
- Data is stored by Pebble app regardless of it being sent
- Can contain INCREDIBLY useful information
  - NOTE: Database does get cleaned when user chooses to clear all notifications

post_time_local	is_dup	is_cle...	cate...	number	sent...	dismi...	_date_created	text	page...	_is_d...	title
1457447759190	0	1		0	0	0	2016-03-08 19:35:59	11:32 AM – 4:02 PM	0		Golf
1457452755835	0	1		0	0	0	2016-03-08 20:59:15	11:32 AM – 4:02 PM	0		Golf
1457507868157	0	1		0	0	0	2016-03-09 12:17:48	Do you know Stacey Banks?	0		Facebook
1457519817878	0	1		0	0	0	2016-03-09 15:36:57	You have 1 poke	0		Facebook
1457520227644	0	1		0	0	0	2016-03-09 15:43:47	Updating "Google Play Movies & TV"...	0		Google Play Movies & TV
1457520236129	0	1		0	0	0	2016-03-09 15:43:56	Google Play Movies & TV and Google Play Newsstand	0		2 applications updated
1457520246521	0	1		0	0	0	2016-03-09 15:44:06	Updating "HP Print Service Plugin"...	0		HP Print Service Plugin
1457520251151	0	1		0	0	0	2016-03-09 15:44:11	HP Print Service Plugin, Google Play Movies & TV, and Go...	0		3 applications updated
1457520263352	0	1		0	0	0	2016-03-09 15:44:23	Updating "Facebook"...	0		Facebook
1457520283952	0	1		0	0	0	2016-03-09 15:44:44	Facebook, HP Print Service Plugin, Google Play Movies & ...	0		4 applications updated
1457520308836	0	1		0	0	0	2016-03-09 15:45:08	Updating "YouTube"...	0		YouTube
1457520321459	0	1		0	0	0	2016-03-09 15:45:21	YouTube, Facebook, HP Print Service Plugin, Google Play ...	0		5 applications updated
1457520331190	0	1		0	0	0	2016-03-09 15:45:31	Updating "Google Calendar"...	0		Google Calendar
1457520341356	0	1		0	0	0	2016-03-09 15:45:41	Google Calendar, YouTube, Facebook, HP Print Service Pl...	0		6 applications updated
1457522587521	0	1		0	0	0	2016-03-09 16:23:07	Computing files...	0		Copying
1457522587649	0	1		0	0	0	2016-03-09 16:23:07	Computing files...	0		Copying
1457522977036	0	1		0	0	0	2016-03-09 16:29:37	Task Details	0		Copying
1457523070069	0	1		0	0	0	2016-03-09 16:31:10	/data/data/com.microsoft.kapp/files/com.microsoft.applic...	0		Copying
1457523070163	0	1		0	0	0	2016-03-09 16:31:10	/data/data/com.microsoft.kapp/files/com.microsoft.applic...	0		Copied
1457523070300	0	1		0	0	0	2016-03-09 16:31:10	Copied files to "/storage/extSdCard/DCIM/Camera/Micro...	0		Copied
1457523070369	0	1		0	0	0	2016-03-09 16:31:10	Copied files to "/storage/extSdCard/DCIM/Camera/Micro...	0		Copied
1457523070776	0	1		0	0	0	2016-03-09 16:31:10	Copied files to "/storage/extSdCard/DCIM/Camera/Micro...	0		Copied
1457523070856	0	1		0	0	0	2016-03-09 16:31:10	Copied files to "/storage/extSdCard/DCIM/Camera/Micro...	0		Copied
1457523120044	0	1		0	0	0	2016-03-09 16:32:00	Computing files...	0		Copying
1457523120239	0	1		0	0	0	2016-03-09 16:32:00	Computing files...	0		Copying
1457527609982	0	1		0	0	0	2016-03-09 17:46:50	Updating "Pebble Time"...	0		Pebble Time
1457528057653	0	1		0	0	0	2016-03-09 17:54:17	Installing "Android Wear - Smartwatch"...	0		Android Wear - Smartwatch
1457528066673	0	1		0	0	0	2016-03-09 17:54:26	Successfully installed.	0		Android Wear - Smartwatch
1457528100148	0	1		0	0	0	2016-03-09 17:55:00	Tap to analyze Android Wear	0		ES App Analyzer
1457528174498	0	1		0	1	1	2016-03-09 17:56:14	Brian Moran and Stacey Randolph poked you.	0		Facebook
1457528316662	0	1		0	1	1	2016-03-09 17:58:36	Getting back onto Facebook	0		Facebook
1457528355534	0	1		0	0	0	2016-03-09 17:59:15		0		Gmail
1457528358288	0	1		0	1	1	2016-03-09 17:59:18	Stacey Randolph accepted your friend request. You can ...	0		Facebook
1457528917619	0	1		0	1	1	2016-03-09 18:08:37	Stacey Randolph commented on a link you shared.	2		Facebook
1457528919387	0	1		0	1	0	2016-03-09 18:08:39	Stacey Randolph commented on a link you shared.	0		Facebook

Pebble Time storage (Android mobile device)

- Table “timeline_items” contains a listing notifications actually sent to device

- This data is stored as json inside of a SQLite database



tem_id	created_time...	_id	is_re...	layout_json
c19b6014-c214-407b-a090-36e523a87619	1457371854179	27	0	{"layout_name":"calendarPin","attributes":[{"attribute_n...
421a366f-1708-4b1e-a3be-7a9ce76d0d19	1457451120388	31	0	{"layout_name":"calendarPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43901	1457545632025	32	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43902	1457545632219	33	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43903	1457545632517	34	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43904	1457545632891	35	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43905	1457545633117	36	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
61b22bc8-1e29-460d-a236-3fe409a43906	1457545633316	37	0	{"layout_name":"weatherPin","attributes":[{"attribute_n...
0994fc95-cc90-4b9e-844c-9e67b3f0a6df	1457546174614	38	0	{"layout_name":"genericNotification","attributes":[{"attri...
c7d339ee-063e-4789-9b54-e54ecf79e59d	1457546316899	39	0	{"layout_name":"genericNotification","attributes":[{"attri...
e453aee0-e264-4009-8ffe-87b5070e24f7	1457546358399	40	0	{"layout_name":"genericNotification","attributes":[{"attri...
ac667d5b-5024-4b0d-909c-17b34e8a6893	1457546917716	41	0	{"layout_name":"genericNotification","attributes":[{"attri...
42fe88e7-7e1c-4239-9cc7-c9f4a11b2c32	1457546919489	42	0	{"layout_name":"genericNotification","attributes":[{"attri...


```
{"layout_name":"genericNotification","attributes":
[{"attribute_name":"title","attribute_value":"Facebook"},
{"attribute_name":"body","attribute_value":"Stacey Randolph commented on a link you shared."},
{"attribute_name":"tinyIcon","attribute_value":"system://images/NOTIFICATION_FACEBOOK"},
{"attribute_name":"backgroundColor","attribute_value":"#0055AA"}]}
```

Pebble Time storage (Android mobile device)

- Table “weather_locations” contains a list of “locations” that the device receives weather updates

- Can be useful to determine if an individual was in a certain place at a certain time

weather_locations

latitude	_nee...	location_uuid	_id	location_n...	upda...	longitude	is_ti...	_date_updated	i
39.1258482	0	3facfb80-bb28-4da0-b999-78b8eb7274e3	1	user_location	0	-76.6373679	1	2016-03-03 22:47:04	

2016-03-03 22:47:04

Pebble Time storage (Android mobile device)

- SMS message notifications are stored under “notifications” table.
  - The “package_name” is bank, the “SOURCE” is “SMS”

Remember, this can potentially contain messages that were deleted from the phone, cannot be recovered through any other tool/mechanism but ARE stored within this database!

Pebble Time storage (Android mobile device)

post_time...	_date_created	title	body	_date_updated	source
1458650190187	2016-03-22 16:36:30	900080004000	Free VZW Msg: Good news! Your $45.00 monthly plan is ...	2016-03-22 16:36:30	SMS
1458650200931	2016-03-22 16:36:40	900080004000	Free VZW Msg: Thank you for choosing Verizon! We've a...	2016-03-22 16:36:40	SMS
1458650215210	2016-03-22 16:36:55	900080004000	Free VZW Msg: Thanks for your payment! Your monthly ...	2016-03-22 16:36:55	SMS
1458659347655	2016-03-22 19:09:07	01189998819991197253	Hi Peacock!! It's Stacey. So happy you have a new numb...	2016-03-22 19:09:07	SMS
1458659938735	2016-03-22 19:18:58	01189998819991197253	Oh Peacock. You are a little man of not so many words.	2016-03-22 19:18:58	SMS
1458661156148	2016-03-22 19:39:16	01189998819991197253	Hey I like Michael Bolton! He did a great job beating the c...	2016-03-22 19:39:16	SMS

Hey I like Michael Bolton! He did a great job beating the copier with a baseball bat!

Pebble Time storage (iOS devices)

- Obligatory Pebble data on iOS devices slides
- Main database of interest is named "PBMyPebbleAppDataCoreDataManager.sqlite"
- "f97bcd6b4a35ff9054977f0f62d141cb6580737b"
  – iOS Backup file name (iOS 9 & earlier)

Name	Type	NN	PK	Defa...
main	C:\Users\Brian\Desktop\PB...			
Tables (29)				
Z_27LOCKERAPPS				
Z_27SORTEDWATCHAPPS				
Z_27SORTEDWATCHFACES				
Z_METADATA				
Z_PRIMARYKEY				
ZAPPPREFERENCE				
ZAPPPREFERENCESTATUS				
ZCALENDAR				
ZCALENDARALARM				
ZCALENDAREVENT				
ZCALENDAREVENTSTORE				
ZCALENDARSOURCE				
ZCONTACTPREFERREDPHONE				
ZCONTACTSTATUS				
ZINSTALLATION				
ZNOTIFICATIONSOURCESTATUS				
ZPREFERENCE				
ZPREFERENCESTATUS				
ZTIMELINEDATASOURCE				
ZTIMELINEITEMATTRIBUTABLE				
ZTIMELINEITEMATTRIBUTE				
ZTIMELINEITEMSTATUS				
ZUSERACCOUNT				
ZWATCH				
ZWATCHAPP				
ZWATCHAPPCOMPATIBILITY				
ZWATCHAPPHARDWAREPLATFORM				
ZWEATHERAPPRECORD				
ZWEATHERAPPRECORDSTATUS				

ZTIMELINEITEMATTRIBUTABLE

Z_PK	Z_ENT	Z_OPT	ZAD...	ZCO...	ZCO...	ZFLAGS	ZACT...	ZACT...	Z19_...	ZFLA...	ZSO...	ZVER...
1	20	2								0		0
2	20	3								0		0
3	20	2								0		0
4	23	23										
5	23	23										
6	23	23										
8	23	23										
9	23	23										
10	23	1										
11	23	2										
12	23	1										
13	20	1								0		0
14	23	1										
15	23	12										
16	20	1								0		0

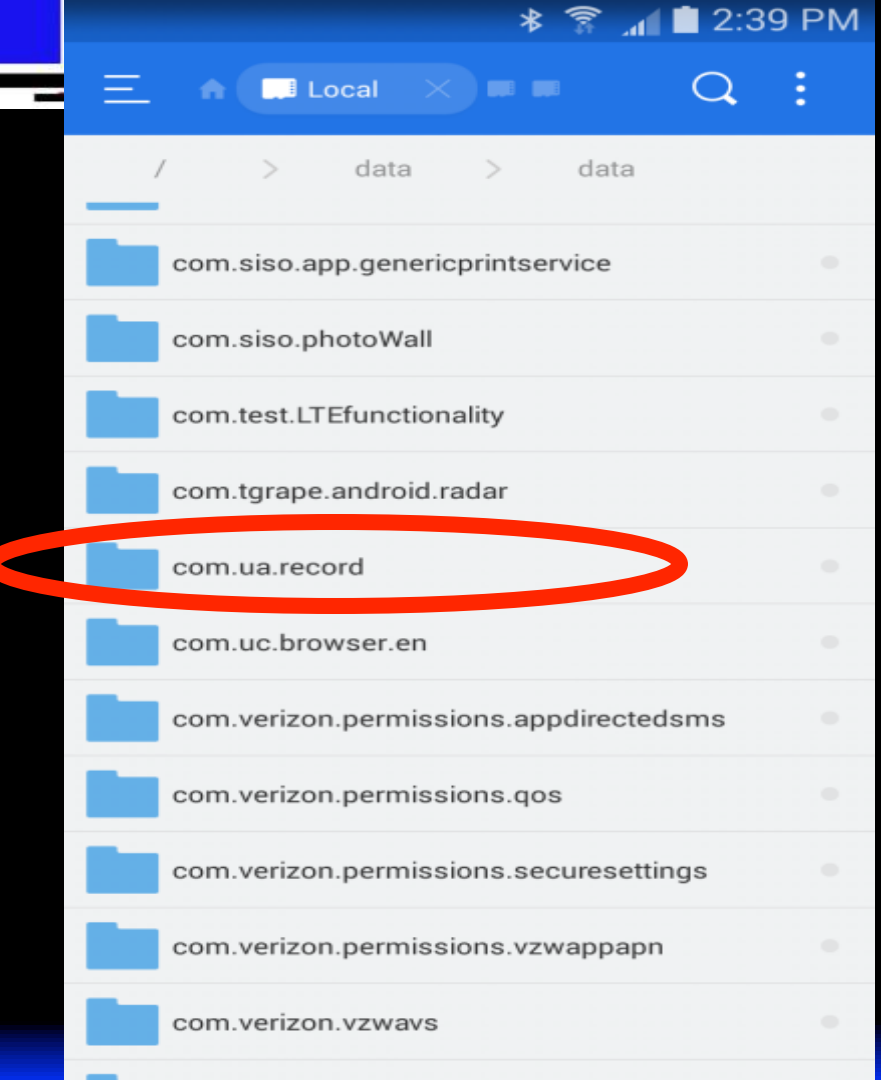
1

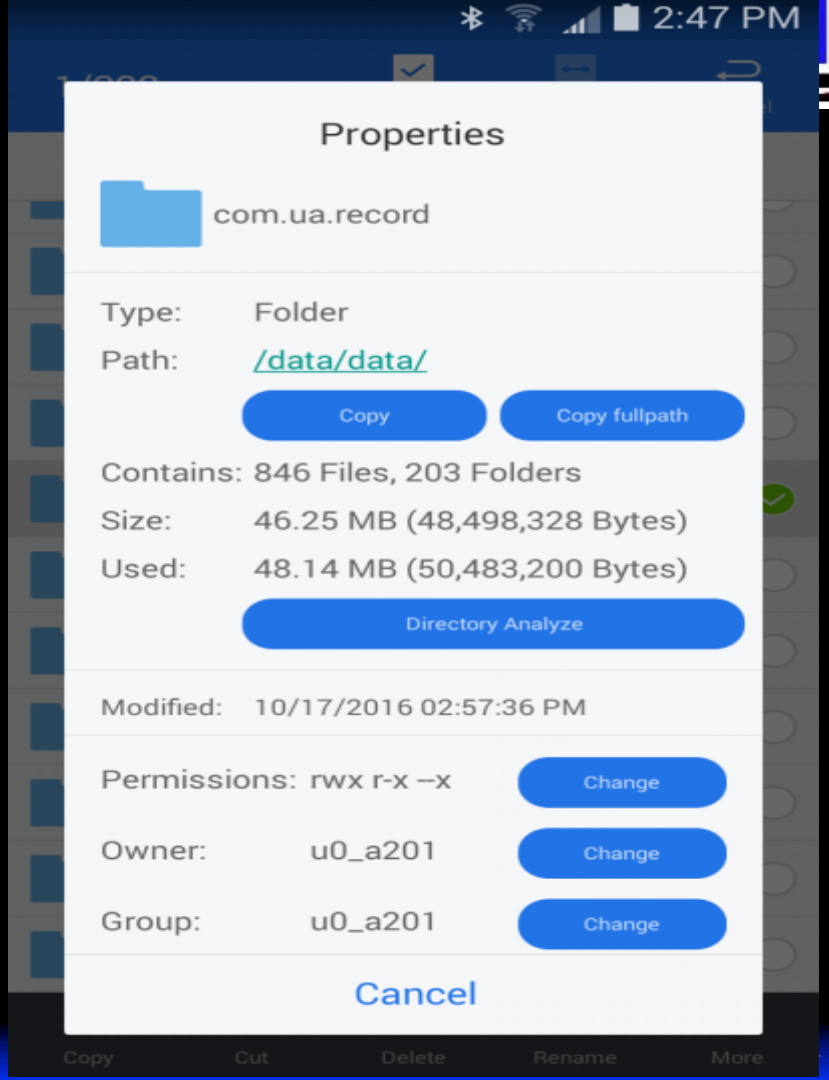
Under Armour Band Specs

- Processor: ARM Cortex M4 MCU CPU
- Storage: 8MB onboard storage
- 1.3” PMOLED touchscreen
- Battery: 112 mAh battery (average battery life 5 days)
- Bluetooth: Bluetooth 4.0
- Source: *http://www.techradar.com/reviews/wearables/ua-band-1312190/review*

UA Band storage (Android mobile device)

- Path: /data/data/com.ua.record
  - Make sure it is NOT “emulated”

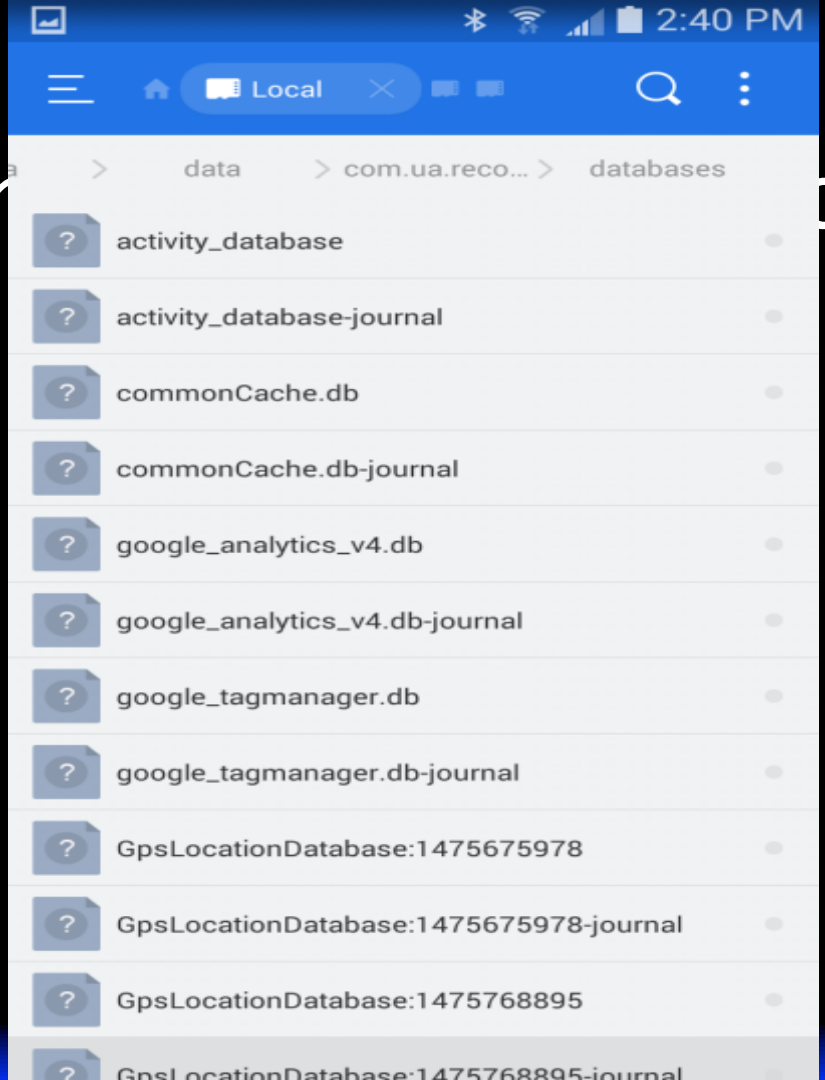

2:39 PM
Local
/ > data > data
com.siso.app.genericprintservice
com.siso.photoWall
com.test.LTEfunctionality
com.tgrape.android.radar
com.ua.record
com.uc.browser.en
com.verizon.permissions.appdirectedsms
com.verizon.permissions.qos
com.verizon.permissions.securesettings
com.verizon.permissions.vzwappapn
com.verizon.vzwavs


2:47 PM
Properties
com.ua.record
Type: Folder
Path: /data/data/
Copy
Copy fullpath
Contains: 846 Files, 203 Folders
Size: 46.25 MB (48,498,328 Bytes)
Used: 48.14 MB (50,483,200 Bytes)
Directory Analyze
Modified: 10/17/2016 02:57:36 PM
Permissions: rwx r-x --x
Change
Owner: u0_a201
Change
Group: u0_a201
Change
Cancel
Copy
Cut
Delete
Rename
More

UA Band storage (Android mobile device)

- Primary folder of interest is “databases”
- Folder contains several SQLite databases with kind of easy to decipher names
  - Kind of

(Ar ce)


2:40 PM
Local
data
com.ua.reco...
databases
activity_database
activity_database-journal
commonCache.db
commonCache.db-journal
google_analytics_v4.db
google_analytics_v4.db-journal
google_tagmanager.db
google_tagmanager.db-journal
GpsLocationDatabase:1475675978
GpsLocationDatabase:1475675978-journal
GpsLocationDatabase:1475768895

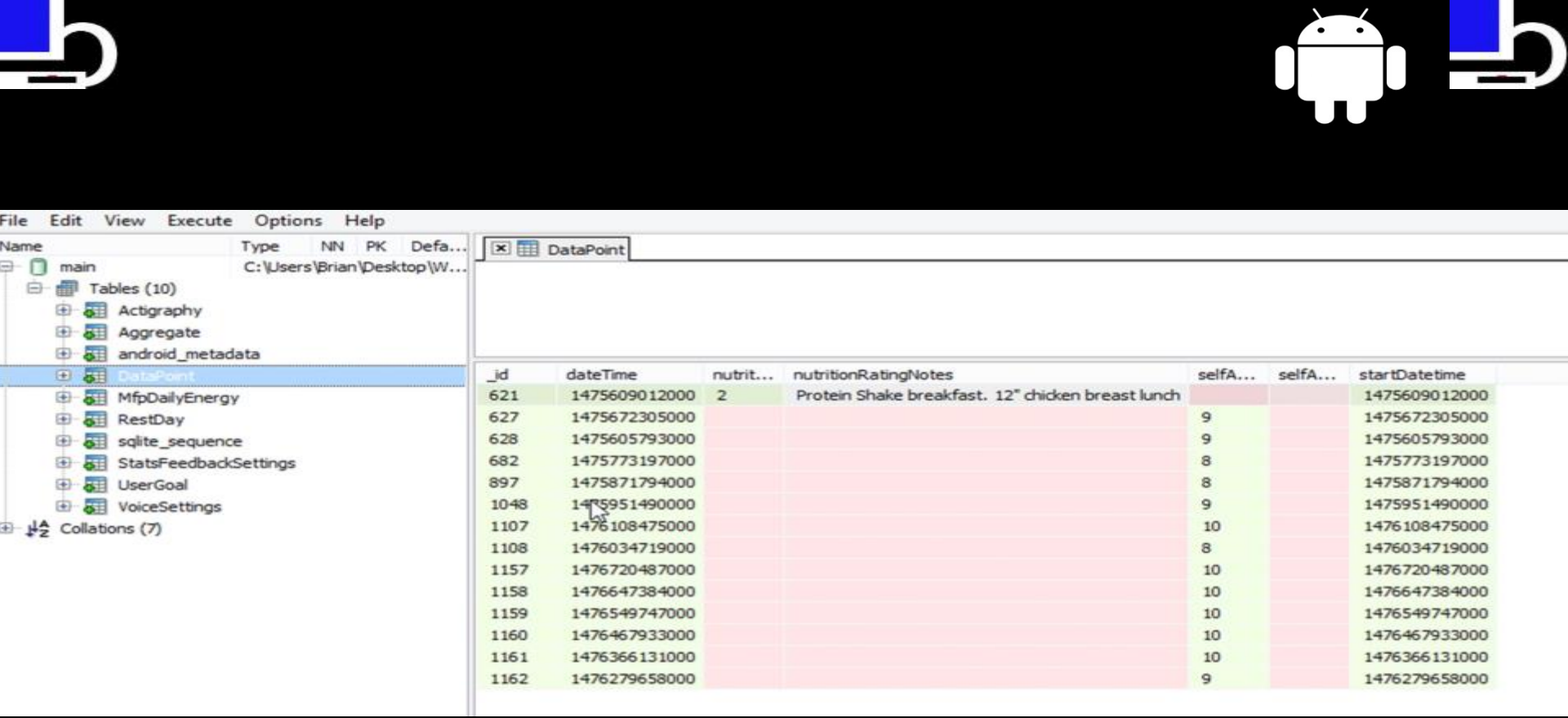
UA Band storage (Android mobile device)

- SQLite databases of particular interest (to date):
  - commonCache.db
  - mmdk_user
  - usadk_workout

- As more research is done, it is likely more information will be found!

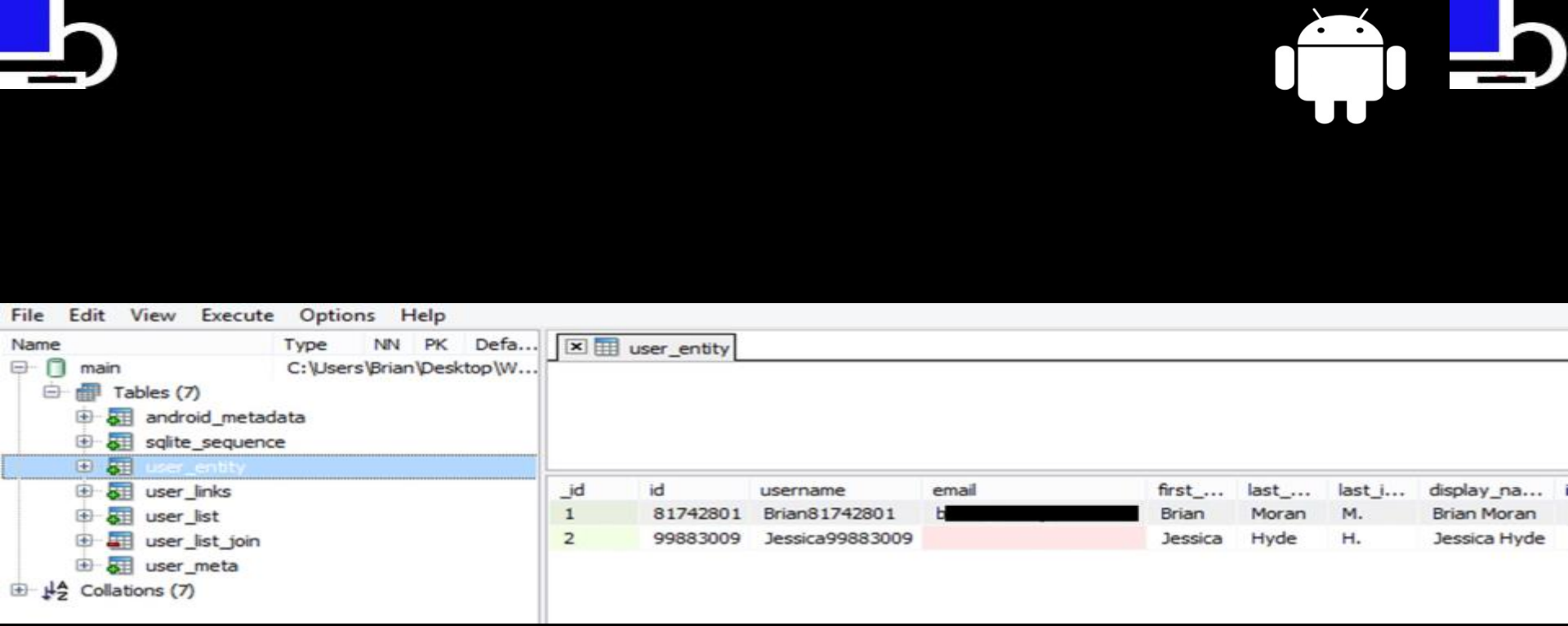
UA Band storage (Android mobile device)

- commonCache.db contains the following tables of primary interest
  - Data Point
    - Can record notes about meals, entirely dependent on user
  - MfpDailyEnergy
    - Can contain detailed calorie information bout meals


File Edit View Execute Options Help
Name Type NN PK Defa...
main C:\Users\Brian\Desktop\W...
Tables (10)
Actigraphy
Aggregate
android_metadata
DataPoint
MfpDailyEnergy
RestDay
sqlite_sequence
StatsFeedbackSettings
UserGoal
VoiceSettings
Collations (7)
DataPoint
_id dateTime nutrit... nutritionRatingNotes selfA... selfA... startDatetime
621 1475609012000 2 Protein Shake breakfast. 12" chicken breast lunch 1475609012000
627 1475672305000 9 1475672305000
628 1475605793000 9 1475605793000
682 1475773197000 8 1475773197000
897 1475871794000 8 1475871794000
1048 1475951490000 9 1475951490000
1107 1476108475000 10 1476108475000
1108 1476034719000 8 1476034719000
1157 1476720487000 10 1476720487000
1158 1476647384000 10 1476647384000
1159 1476549747000 10 1476549747000
1160 1476467933000 10 1476467933000
1161 1476366131000 10 1476366131000
1162 1476279658000 9 1476279658000

UA Band storage (Android mobile device)

- mmdk_user
  - Database contains information on the primary user associated with the UA Record account on mobile device
  - Also includes information on any “friends” of the user
    - Thanks Jessica!!


File Edit View Execute Options Help
Name Type NN PK Defa...
main C:\Users\Brian\Desktop\W...
Tables (7)
android_metadata
sqlite_sequence
user_entity
user_links
user_list
user_list_join
user_meta
Collations (7)
user_entity
id id username email first... last_... last_i... display_na...
1 81742801 Brian81742801 [redacted] Brian Moran M. Brian Moran
2 99883009 Jessica99883009 Jessica Hyde H. Jessica Hyde

UA Band storage (Android mobile device)

- usadk_workout
  - Contain information on workouts performed by user associated with the UA Record account on device
  - Also contains information on workouts performed by “friends”
  - DOES NOT include comments left on workout posts
    - That I have found thus far



File Edit View Execute Options Help

Name Type

main C:\Use

Tables (7)

- android_metadata
- sqlite_sequence
- workout_entity
- workout_links
- workout_list
- workout_list_join
- workout_meta

Collations (7)

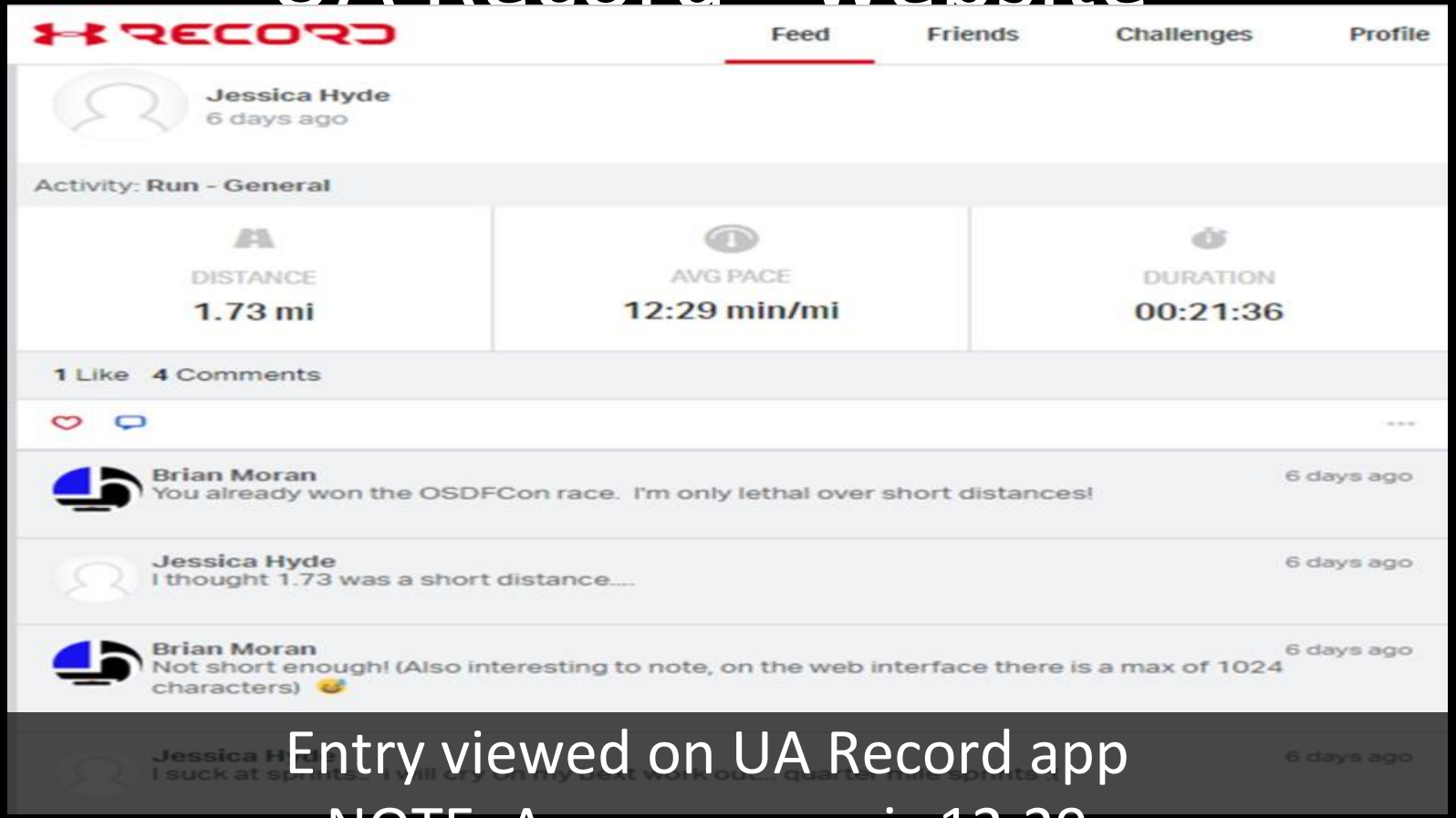
workout_entity

_id	remote_id	name	start_datetime	start_locale_tim...	created_date...	updated_dat...	reference_key	source
6	1794861638	Run	1475768895000	America/Detroit	1475770105000	1475770105000	CBTD_1475770095000	Record Android
7	1794955511	Gym Workout	1475770124000	America/Detroit	1475773014000	1475773014000	CBTD_1475773001000	Record Android
8	1801938332	Cycling	1476109692000	America/Detroit	1476114704000	1476117954000	CBTD_1476110738000	Record Android
9	1801938338	Gym Workout	1476110817000	America/Detroit	1476114704000	1476114704000	CBTD_1476114554000	Record Android
10	1804135115	Run	1476194873000	America/Detroit	1476198262000	1476198262000	CBTD_1476196664000	Record Android
11	1804234703	Gym Workout	1476199144000	America/Detroit	1476201506000	1476201506000	CBTD_1476201503000	Record Android
12	1806478421	Cycling	1476283519000	America/Detroit	1476290203000	1476290203000	CBTD_1476285049000	Record Android
13	1806478442	Gym Workout	1476285064000	America/Detroit	1476290204000	1476290204000	CBTD_1476289837000	Record Android
14	1808336819	Ride	1476370020000	America/Detroit	1476372624000	1476372729000	CBTD_1476371968000	Record Android
15	1808397515	Gym	1476372900000	America/Detroit	1476374800000	1476377763000	CBTD_1476374785000	Record Android
16	1810408760	Ride	1476459660000	America/Detroit	1476466823000	1476469698000	CBTD_1476460430000	Record Android
17	1810408763	Gym	1476460860000	America/Detroit	1476466823000	1476469648000	CBTD_1476465586000	Record Android
18	1810510922	General	1476442920000	America/Detroit	1476471038000	1476471038000	record_androidFri Oct 14 07:02:00 EDT 2016	Record Android
19	1812536102	Walk	1476559544000	America/Detroit	1476562147000	1476562260000	CBTD_1476560925000	Record Android
20	1815666684	Ride	1476712680000	America/Detroit	1476719197000	1476720528000	CBTD_1476713341000	Record Android
21	1815666693	Gym Workout	1476713434000	America/Detroit	1476719197000	1476720322000	CBTD_1476718530000	Record Android
22	1815738038	1.73 mi Run on 10/17/16	1476720052000	America/Detroit	1476721367000	1476721367000	record_androidMon Oct 17 12:00:52 EDT 2016	Record Android
23	1812353009	6.74 mi Walk on 10/15/16	1476543072000	America/Detroit	1476555539000	1476555539000	record_androidSat Oct 15 10:51:12 EDT 2016	Record Android

UA Record - website

- Limited information is available via the website
- Most of the functionality is in the app on the mobile device

UA Record - website



Entry viewed on UA Record app

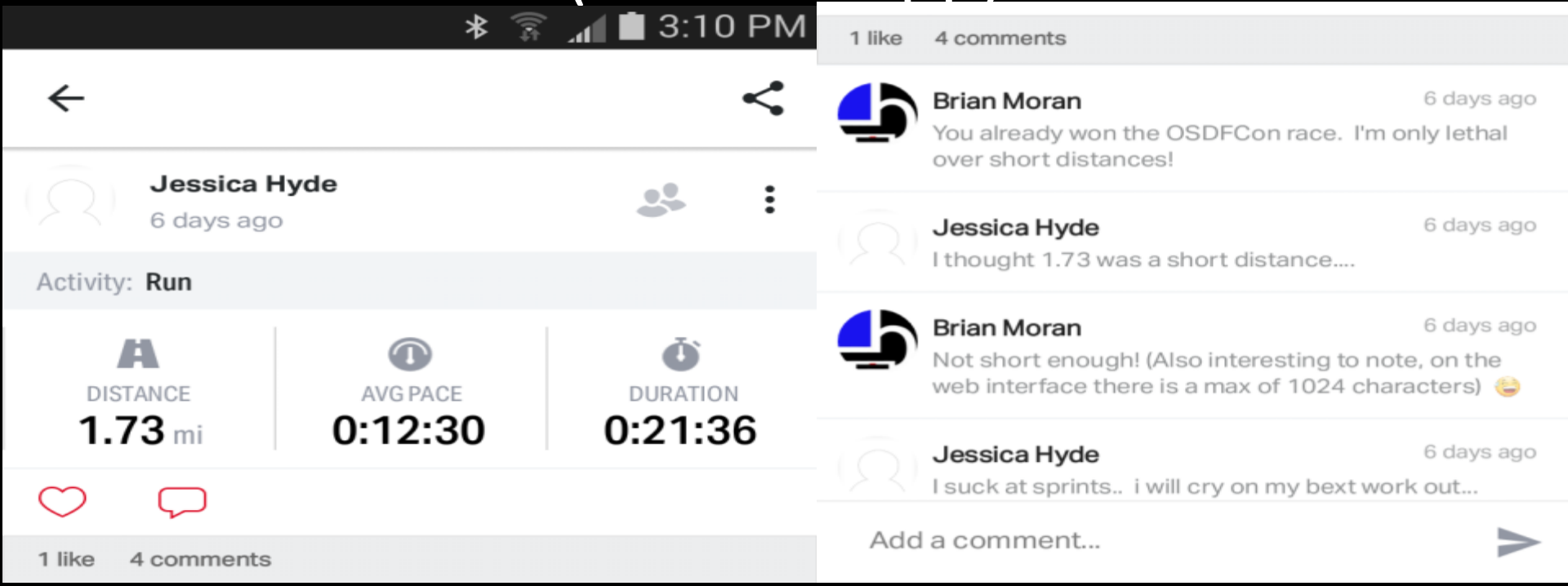
NOTE: Average pace is 12:29

UA Record (Android app)

- Much more functionality
  - Many more options to do many more things

- One important note: “My Feed” does not appear to store any data on the device. So every time you want to see the feed, EVERYTHING gets downloaded again

UA Record (Android app)



Entry viewed on UA Record app

NOTE: Average pace is 12:30

UA Record (Android app)

- Almost all app data is stored in metric increments
  - Joules
  - Meters
  - Meters/second
  - And more

- This means things like pace/distance/weight/etc. can vary depending on how “ROUND” is computed on various platforms.

Important Take Away(s)

- Smart watches are essentially content notification devices
  - Require another device (mobile device) to “fully” work
- Most of the interesting data will be stored on the mobile device itself
- Connected apps/websites can have even MORE data!

Important Take Away(s)

- Timestamps are dependent on exact time on device/ platform being analyzed & unit conversion(s)
- Trust the raw data, but be prepared for slight time skew
- No current method to “secure” most smart watches
  - It pains me to say this, but it is one thing that Apple got right

Important Take Away(s)

- If you are going to do something bad, don't wear a smartwatch/fitness tracker

- Additionally, if you are going to lie about something bad happening to you, don't wear a smartwatch/fitness tracker

LAW BLOG

Prosecutors Say Fitbit Device Exposed Fibbing in Rape Case

PHOTO: THE WALL STREET JOURNAL

By JACOB GERSHMAN
Apr 21, 2016 1:53 pm ET

0 COMMENTS

Data has always been a double-edged sword. The convenience, efficiency and knowledge on one side and privacy fears, surveillance concerns and cybercrime on the other.

Most Popular Videos

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3. Trump Mistakenly Refers to 9/11 as '7-Eleven'
4. Deadly Explosion at Mexichem-Pemex Plant in Mexico
5. The Trump Show: From Improv to Scripted Drama

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2. The Librarian Who Saved Timbuktu's Cultural Treasures From al Qaeda
3. Queen Elizabeth II Celebrates 90th Birthday

An officer at the scene spotted a Fitbit device on the floor of a hallway. During the investigation, she "agreed to provide [police] with her fitbit user name and password as well as the dongle to download the data off" the device, an arrest affidavit states.

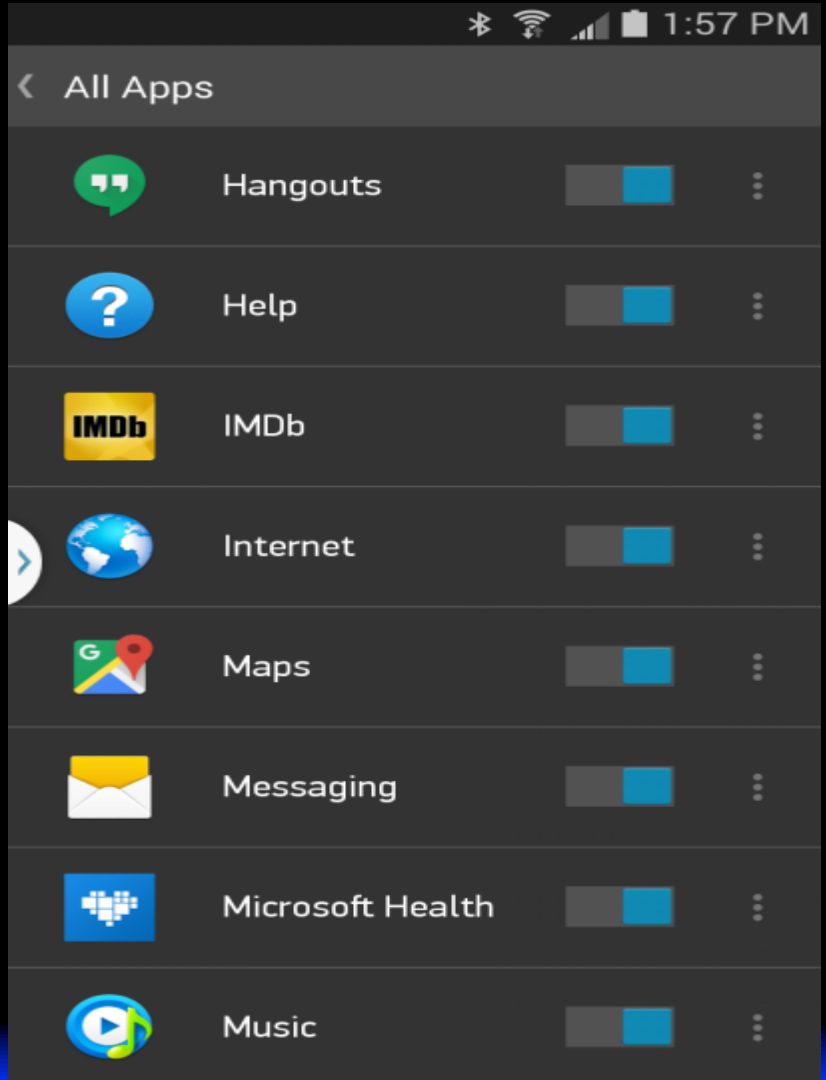
Prosecutors say the Fitbit caught her fibbing. According to the affidavit:

> The information collected from the fit bit [sic] device showed that Nina was awake and walking around the entire night prior to the incident and did not go to bed as reported. The Fitbit shows activity up until the time of the call and then again only when it is collected by your Affiant. That based on the above and additional evidence your Affiant believes that the Defendant Nina Risley was not raped as reported and fabricated the entire incident.

The Fitbit evidence "definitely turned the case," Brett Hambright, a spokesman for the Lancaster County district attorney's office, told Law Blog.

Protecting your data

- Only turn on notifications you want to record
  - NOTE: iOS will not allow the user to modify some notification settings
- Open Pebble app on mobile device
  - Navigate to “Notifications”
  - Select “View All Apps”
  - Change slider from blue (on) to gray (off) accordingly


1:57 PM
All Apps
Hangouts
Help
IMDb
Internet
Maps
Messaging
Microsoft Health
Music

Protecting your data

- Clear notifications on a regular basis
- On Pebble device,
  - Navigate to “Notifications”
  - Select “Clear All”
- NOTE: You must have at least one notification on the Pebble device to clear the SQLite table on the mobile device

Protecting your data

Protecting your data

- Use strong password(s) for your accounts
- Don’t reuse passwords - Especially for 2nd/3rd party apps

1. password	10. dragon	19. shadow
2. 123456	11. baseball	20. 123123
3. 12345678	12. 111111	21. 654321
4. qwerty	13. iloveyou	22. superman
5. abc123	14. master	23. qazwsx
6. monkey	15. sunshine	24. michael
7. 1234567	16. ashley	25. football
8. letmein	17. bailey	
9. trustno1	18. passw0rd	

Examples of BAD passwords

Data parsing scripts

- https://github.com/brimorlabs
  - allyourpebblearebelongtous.pl
    - Released June 2016
  - allyouruarecordarebelongtous.pl
    - Released October 2016

- Why Perl?
  - Easier (for me)
  - Want companies (Cellebrite) to at least do a little work to make money off of open source research ☺

allyourpebblearebelongtous.pl

- Give the script a pebble database & output folder and let it run
- Tries to figure out if it is iOS or android & parses data accordingly

allyourpebblearebelongtous.pl

```
C:\Users\Brian\Desktop>allyourpebblearebelongtous.pl  -file pebble -output NoteI
I-Pebble

Processing C:\Users\Brian\Desktop\pebble

Good news everyone!!
This looks like a pebble database, so we will proceed

Good news everyone!!
The table "android_apps" exists in this database. Beginning to parse data now.
The parsing of the table "android_apps" has completed. Moving on to next table n
ow.

Good news everyone!!
The table "notifications" exists in this database. Beginning to parse data now.
The parsing of the table "notifications" has completed. Moving on to next table
now.

Good news everyone!!
The table "canned_responses" exists in this database.
Beginning to parse data now.
The parsing of the table "cannedresponses" has completed. Moving on to next tabl
e now.

Good news everyone!!
The table "phone_numbers" exists in this database.
Beginning to parse data now.
The parsing of the table "phone_numbers" has completed. Moving on to next table
now.

Finished pebble data parsing succesfully
```

Screenshot of script running

allyourpebblearebelongtous.pl

- Produces easy to read HTML output for:
  - Android
    - Applications
    - Canned responses
    - Notifications
    - Phone numbers
  - iOS
    - Notifications

Android - Output of parsed notifications

2016-03-22 16:36:55	900080004000	Free VZW Msg: Thanks for your payment! Your monthly plan has been renewed and will be good through 04/21/2016.		SMS
2016-03-22 16:36:56	Messaging	3 new messages.	com.android.mms	NOTIFICATION
2016-03-22 16:49:11	Message not sent.	Review message and try again.	com.android.mms	NOTIFICATION
2016-03-22 19:09:07	312[redacted]	Hi Peacock!! It's Stacey. So happy you have a new number. :)		SMS
2016-03-22 19:09:08	Messaging	New message.	com.android.mms	NOTIFICATION
2016-03-22 19:18:58	312[redacted]	Oh Peacock. You are a little man of not so many words. 😊		SMS
2016-03-22 19:18:59	Messaging	New message.	com.android.mms	NOTIFICATION
2016-03-22 19:39:16	312[redacted]	Hey I like Michael Bolton! He did a great job beating the copier with a baseball bat!		SMS

iOS - Output of parsed notifications

	2016-05-13 15:11:40		com.apple.MobileSMS		muteDaysOfWeek	0
	2016-05-13 15:11:40		com.apple.MobileSMS		lastUpdated	2016-05-13T15:11:40Z
	2016-05-13 15:11:40		com.apple.MobileSMS		applicationName	Messages
	2016-05-13 18:24:00		jp.naver.line		applicationName	LINE
	2016-05-13 18:24:00		jp.naver.line		muteDaysOfWeek	0
	2016-05-13 18:24:00		jp.naver.line		lastUpdated	2016-05-13T18:23:59Z
2016-06-14 04:00:00		2016-05-14 04:14:53		calendarPin	tinyIcon	system://images/TIMELINE_CALENDAR
2016-06-14 04:00:00		2016-05-14 04:14:53		calendarPin	title	Flag Day
2016-06-14 04:00:00		2016-05-14 04:14:53		calendarPin	lastUpdated	2014-05-26T08:01:03Z
2016-05-14 09:47:54		2016-05-14 18:16:03		weatherPin	body	Scattered showers and thunderstorms. Gusty winds and small hail are possible. High 71F. Winds SW at 10 to 15 mph. Chance of rain 50%.

allyouruarecordarebelongtous.pl

- Simply give the script:
  - UA Record database or directory
  - output folder

allyouruarecordarebelongtous.pl

```
Processing C:\Users\Brian\Desktop\WhoWatchesTheSmartWatches-Data\October 23, 201
6\UA Record\databases\activity_database-journal

Moving on to next UA Record database.

Processing C:\Users\Brian\Desktop\WhoWatchesTheSmartWatches-Data\October 23, 201
6\UA Record\databases\commonCache.db

Good news everyone!!
The table "MfpDailyEnergy" exists in this database.
Beginning to parse data now.
The parsing of the table "MfpDailyEnergy" has completed.
Moving on to next table now.

Good news everyone!!
The table "DataPoint" exists in this database.
Beginning to parse data now.
The parsing of the table "DataPoint" has completed.
Moving on to next table now.
Moving on to next database now.
Exiting "we_in_uasdk_workout" subroutine.
Moving on to next database now.
Exiting "mmdk_user" subroutine.

Processing C:\Users\Brian\Desktop\WhoWatchesTheSmartWatches-Data\October 23, 201
6\UA Record\databases\commonCache.db-journal

Moving on to next UA Record database.

Processing C:\Users\Brian\Desktop\WhoWatchesTheSmartWatches-Data\October 23, 201
6\UA Record\databases\google_analytics_v4.db
Moving on to next database now.
Exiting "mfp_in_commonCache" subroutine.
Moving on to next database now.
Exiting "commonCaches" subroutine.
Moving on to next database now.
Exiting "we_in_uasdk_workout" subroutine.
```

Screenshot of script running

allyouruarecordarebelongtous.pl

- Produces easy to read HTML output for:
  - Android
    - Data points
    - Calorie data
    - User information
    - Workout entries
  - iOS
    - Coming soon!!

Android - Output of parsed Data Points

UA Record/Data Point Tracker from database file "commonCache.db"

Date/Time	Nutriton Rating	Nutrition Rating Notes	Self Assessment Rating	Self Assessment Rating Notes	Start Date/Time
2016-10-04 18:29:53			9		2016-10-04 18:29:53
2016-10-04 19:23:32	2	Protein Shake breakfast. 12" chicken breast lunch			2016-10-04 19:23:32
2016-10-05 12:58:25			9		2016-10-05 12:58:25
2016-10-06 16:59:57			8		2016-10-06 16:59:57
2016-10-07 20:23:14			8		2016-10-07 20:23:14
2016-10-08 18:31:30			9		2016-10-08 18:31:30
2016-10-09 17:38:39			8		2016-10-09 17:38:39
2016-10-10 14:07:55			10		2016-10-10 14:07:55
2016-10-12 13:40:58			9		2016-10-12 13:40:58
2016-10-13 13:42:11			10		2016-10-13 13:42:11

Android - Output of parsed Calorie data

UA Record/My Fitness Pal Tracker from database file "commonCache.db"

Date	Calories Consumed	Calories Burned From Exercise	Goal	Remaining
2016-10-03	0	0	2680	2680
2016-10-04	1817	1214	2680	2077
2016-10-05	1338	1147	2680	2489
2016-10-06	1525	670	2680	1825
2016-10-07	2160	0	2680	520
2016-10-08	1890	0	2680	790
2016-10-09	2357	0	2680	323
2016-10-10	2203	848	2850	1495
2016-10-11	1708	513	2680	1485

Android - Output of parsed User Info

UA Record/User Information data from database file "mmdk_user.db"

UA Record User ID	UA Record UserName	Email Address	First Name	Last Name	Display Name	Introduction	Hobb
81742801	Brian81742801	b[redacted]t	Brian	Moran	Brian Moran		
99883009	Jessica99883009		Jessica	Hyde	Jessica Hyde		

User Time Zone	Date Joined UA Record	Last Login UA Record	Address	City	Region	County	Profile Image URL
America/Detroit	1452253243000	1452253243000		Millersville	MD	US	http://drzetlglcbfx.cloudfront.net/profile/81742801/picture?size=large
America/New_York	1476315525000			Fredericksburg	VA	US	http://drzetlglcbfx.cloudfront.net/profile/99883009/picture?size=large

Android - Output of parsed Workouts

UA Record/Workout Entity data from database file "uasdk_workout.db"

UA Record User ID	Name	Date/Time Workout Started (UTC)	Workout Account Timezone	Date/Time Workout Created (UTC)	Date/Time Workout Last Updated (UTC)	Source	Notes	Total Distance in Miles (Rounded)	Calories	Active Time	Total Workout Time	Total Steps	Average Speed (Miles per Hour)
81742801	Workout Video	2016-10-05 01:05:00	America/Detroit	2016-10-04 19:22:57	2016-10-04 19:22:57	Record Android		0	1214	01:30:00	01:30:00		
81742801	Generic on Oct. 4, 2016	2016-10-04 16:05:00	America/Detroit	2016-10-05 12:53:25	2016-10-05 12:53:25	Unknown MyFitnessPal(MyFitessPal)		0	1214	01:30:00	01:30:00		
81742801	Generic on Oct. 5, 2016	2016-10-05 17:02:00	America/Detroit	2016-10-05 16:43:29	2016-10-05 16:43:29	Unknown MyFitnessPal(MyFitessPal)		0	1147	01:40:00	01:40:00		
81742801	Run	2016-10-06 15:48:15	America/Detroit	2016-10-06 16:08:25	2016-10-06 16:08:25	Record Android		1.07	139	00:20:00	00:20:00	2025	3.2
81742801	Gym Workout	2016-10-06 16:08:44	America/Detroit	2016-10-06 16:56:54	2016-10-06 16:56:54	Record Android		0.4	531	00:47:57	00:47:57	816	0.5
81742801	Cycling	2016-10-10 14:28:12	America/Detroit	2016-10-10 15:51:44	2016-10-10 16:45:54	Record Android	Six miles on stationary bike	0	134	00:17:26	00:17:26		
81742801	Gym Workout	2016-10-10 14:46:57	America/Detroit	2016-10-10 15:51:44	2016-10-10 15:51:44	Record Android		0.74	714	01:02:17	01:02:17	1553	0.7
81742801	Run	2016-10-11 14:07:53	America/Detroit	2016-10-11 15:04:22	2016-10-11 15:04:22	Record Android		0.24	63	00:29:51	00:29:51	506	0.5
81742801	Gym Workout	2016-10-11 15:19:04	America/Detroit	2016-10-11 15:58:26	2016-10-11 15:58:26	Record Android		0.73	450	00:39:19	00:39:19	1511	1.1
81742801	Cycling	2016-10-12 14:45:19	America/Detroit	2016-10-12 16:36:43	2016-10-12 16:36:43	Record Android		0	195	00:25:30	00:25:30		
81742801	Gym Workout	2016-10-12 15:11:04	America/Detroit	2016-10-12 16:36:44	2016-10-12 16:36:44	Record Android		0.49	911	01:19:33	01:19:33	1200	0.4

Android - Output of parsed Workouts

							Brian's Triset shoulder routine, reverse swings, lateral raises, semi-circles. 10lbs x 10, 15 seconds between each exercise, 3 sets Dumbbell pullovers, 50lbs x 10, 3 sets Straight bar pull down, 90lbs x 10, 4 sets Shrugs, 225lbs x 15, 3 sets						
99883009	General	2016-10-14 11:02:00	America/Detroit	2016-10-14 18:50:38	2016-10-14 18:50:38	Record Android	Logged manually. Ran 2.1 miles. Unable to log decimal?	2	234	00:20:00	00:20:00	3447	6
81742801	Walk	2016-10-15 19:25:44	America/Detroit	2016-10-15 20:09:07	2016-10-15 20:11:00	Record Android	Short walk around Waugh Chapel with the pugs!	0.39	73	00:23:01	00:23:01	930	1
81742801	Ride	2016-10-17 13:58:00	America/Detroit	2016-10-17 15:46:37	2016-10-17 16:08:48	Record Android	Total distance: 4 miles	4	81	00:10:37	00:10:37		22.6
							Full body warm up, 5lb weights Arms Close grip bench press 65lbs x 15 super set with dumbbell kickbacks 10lbs x 10 95lbs x 15 super set with dumbbell kickbacks 10lbs x 10 135lbs x 10 super set with dumbbell kickbacks 10lbs x 10						

Future development (DEPENDENT ON FREE TIME)

- Collect more data and do more experimentation
  - Capturing traffic to/from smart watches is <STILL> my next goal
- Expand to other smart watches & fitness trackers(maybe?)
  - Fitbit & Garmin are intriguing

Questions?

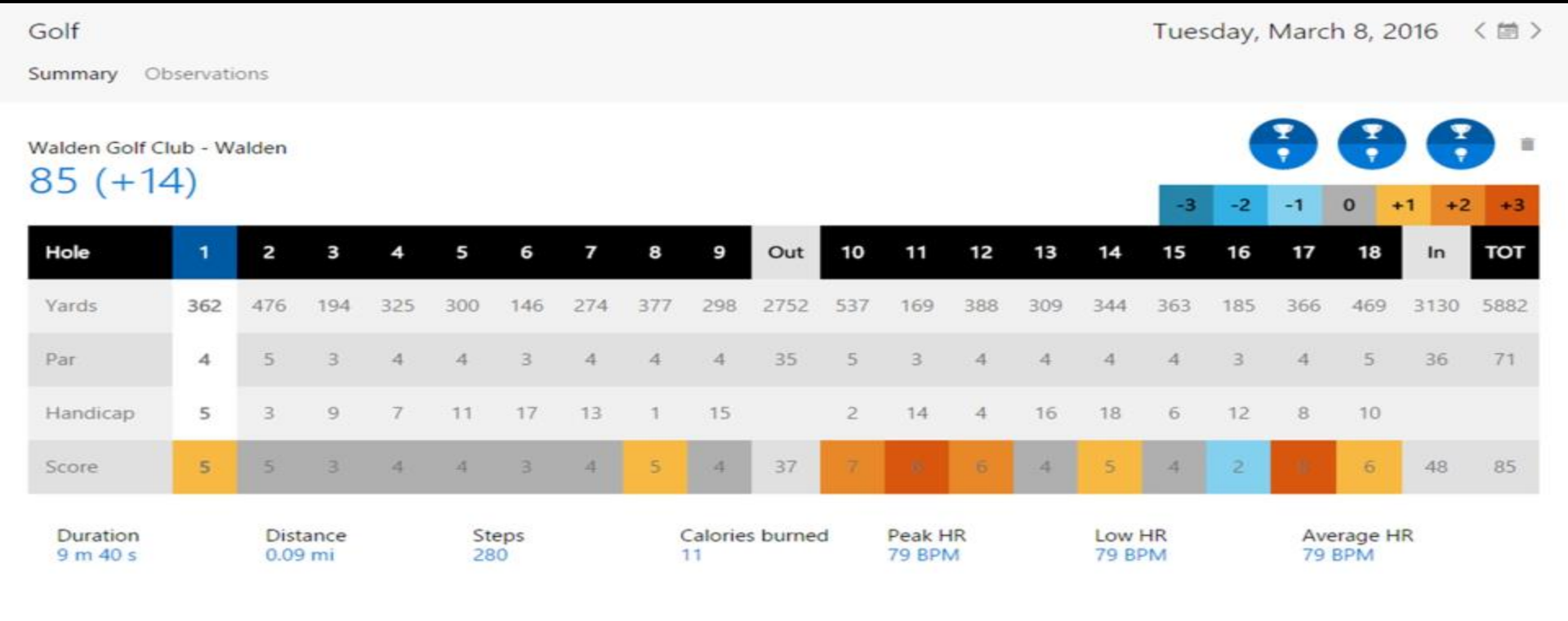
Contact Us!
Email: brian@brimorlabs.com
Phone: 443.834.8280
Website: www.brimorlabs.com
Blog: www.brimorlabsblog.com

Twitter: @BriMorLabs (work)
@brianjmoran (personal)

<FIN>

MICROSOFT BAND 2 INFORMATION

Microsoft Health



Hole	1	2	3	4	5	6	7	8	9	Out	10	11	12	13	14	15	16	17	18	In	TOT
Yards	362	476	194	325	300	146	274	377	298	2752	537	169	388	309	344	363	185	366	469	3130	5882
Par	4	5	3	4	4	3	4	4	4	35	5	3	4	4	4	4	3	4	5	36	71
Handicap	5	3	9	7	11	17	13	1	15		2	14	4	16	18	6	12	8	10		
Score	5	5	3	4	4	3	4	5	4	37	7	8	6	4	5	4	2	8	6	48	85

Duration	Distance	Steps	Calories burned	Peak HR	Low HR	Average HR
9 m 40 s	0.09 mi	280	11	79 BPM	79 BPM	79 BPM

Golf data viewed on Microsoft Health website

Microsoft Health Android app

Golf data viewed on Microsoft Health app

Microsoft Health

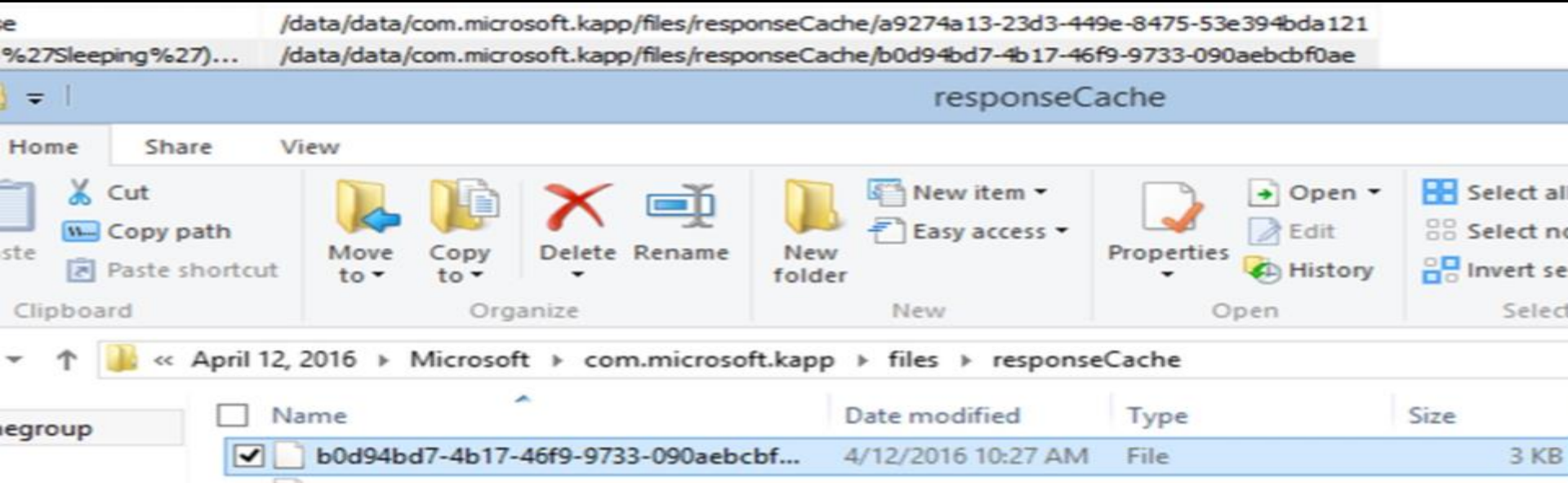
- Same methodology can be applied for all “tracking” aspects
  - Running
  - Workouts
  - Sleep
  - Calories
  - Etc.

Microsoft Band 2 storage (Android mobile device)

id	ResponseFilePath
https://prodphseus.dns-cargo.com//v1/workouts/lastsynced	/data/data/com.microsoft.kapp/files/responseCache/02a624e3-aaf0-4d4e-a74e-825080651e95
https://prodphseus.dns-cargo.com//v2/UserDailySummary(startDate=%27201...	/data/data/com.microsoft.kapp/files/responseCache/08d5b958-ad91-46f4-9fe5-f99ddfe1a0d1
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Workout%27)...	/data/data/com.microsoft.kapp/files/responseCache/16cd7eb2-cdf7-4f35-8a6d-e04967b51cad
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%27160...	/data/data/com.microsoft.kapp/files/responseCache/16f5d144-c081-4a02-99ee-2596f7f51587
https://prodphseus.dns-cargo.com//v2/UserHourlySummary(period=%27h%27...	/data/data/com.microsoft.kapp/files/responseCache/43ddfe1b-15eb-492c-8f38-a75aafbcc4b3
https://prodphseus.dns-cargo.com//v1/8739fbb7-6bcf-4bb3-a217-c07b0f54ee...	/data/data/com.microsoft.kapp/files/responseCache/62f865c9-6316-4405-84fd-c6759ffc7908
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Golf%27)?$to...	/data/data/com.microsoft.kapp/files/responseCache/7415c536-0cb2-4c58-9308-7c24b75ef1fb
https://prodphseus.dns-cargo.com//v1/goals?status=1&isExpand=true&categ...	/data/data/com.microsoft.kapp/files/responseCache/7a8c1144-e6b0-4a00-a373-731240d4b26d
https://prodphseus.dns-cargo.com//v1/8739fbb7-6bcf-4bb3-a217-c07b0f54ee...	/data/data/com.microsoft.kapp/files/responseCache/941d1acb-9187-4e03-92e8-0707cf8d3921
https://prodphseus.dns-cargo.com//v1/goals?status=1&isExpand=false&categ...	/data/data/com.microsoft.kapp/files/responseCache/9662b50c-3e72-4730-82c6-01e8a42fa286
https://prodphseus.dns-cargo.com//v1/workouts/favorites?statusFilter=all	/data/data/com.microsoft.kapp/files/responseCache/9a1825d9-058f-40eb-8e83-8076b1825c7c
https://social.microsoftband.com/api/SocialApi/TileDisplay?facebookUserId=&p...	/data/data/com.microsoft.kapp/files/responseCache/a6d9ab41-7d9b-4f24-b68f-1a21c10f4480
https://prodphseus.dns-cargo.com//v1/goals?isExpand=false	/data/data/com.microsoft.kapp/files/responseCache/a9274a13-23d3-449e-8475-53e394bda121
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Sleeping%27)...	/data/data/com.microsoft.kapp/files/responseCache/b0d94bd7-4b17-46f9-9733-090aebcbf0ae
https://prodphseus.dns-cargo.com//v1/workouts/workoutState	/data/data/com.microsoft.kapp/files/responseCache/bbca8508-9012-44ca-b817-b33fcf1ec31a
https://prodphseus.dns-cargo.com//v2/weights?top=2	/data/data/com.microsoft.kapp/files/responseCache/d23971c1-6c06-4180-89fd-b732f32811df
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%27160...	/data/data/com.microsoft.kapp/files/responseCache/e7d79d39-49fc-48e3-8285-66f12337224c
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27GuidedWorkou...	/data/data/com.microsoft.kapp/files/responseCache/e93fac7b-2278-4ba0-86de-7128801ccbe5

Look at database for file associated with “Sleeping”
b0d94bd7-4b17-46f9-9733-090aebcbf0ae

Microsoft Band 2 storage (Android mobile device)



Browse to “com.microsoft.kapp/files/responseCache/b0d94bd7-4b17-46f9-9733-090aebcbf0ae”

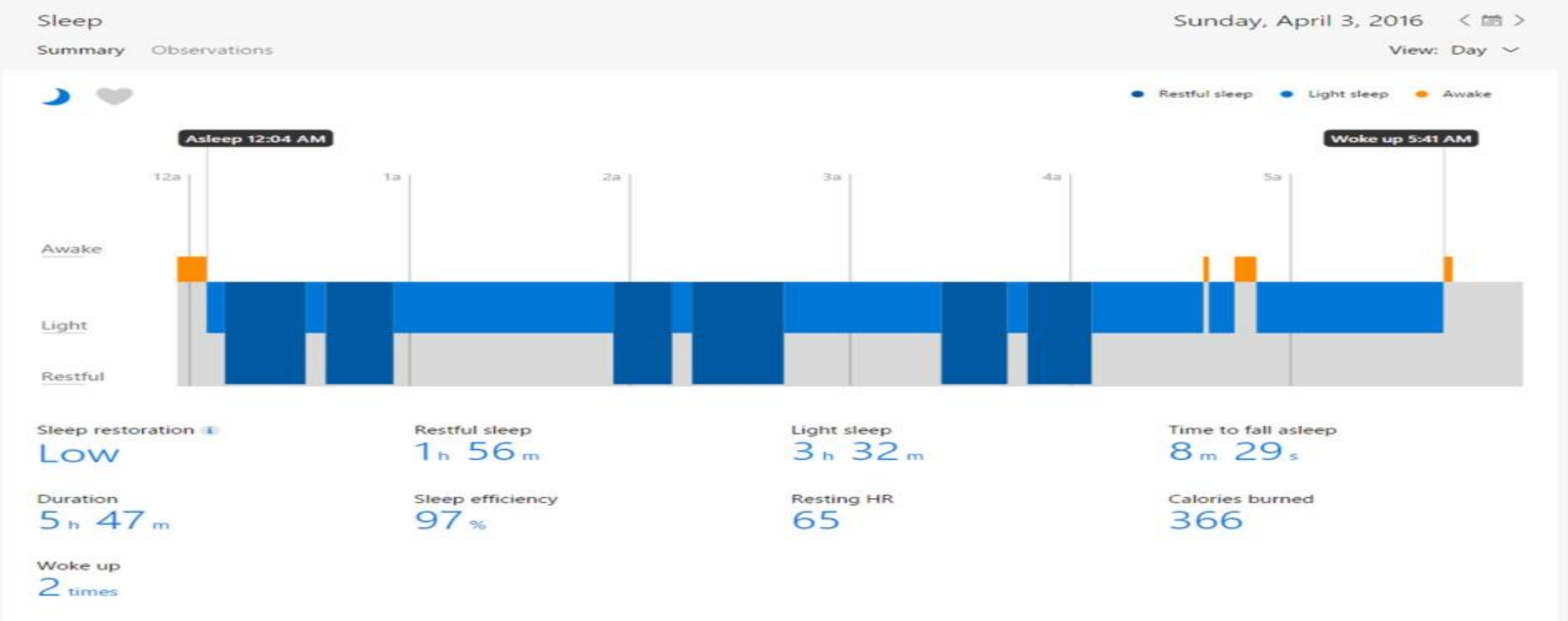
```
{
  "odata.metadata":"https://prodphsews.dms-cargo.com/v1/$metadata#Events/Microsoft.Khronos.Cloud.Ods.Data.Entities.SleepEventDTO","value":[
    {

      "odata.type":"Microsoft.Khronos.Cloud.Ods.Data.Entities.SleepEventDTO","EventId":"2519421146492455749","Duration":22931,"ParentEventId":"0","Name":null,"DeliveryID":0,"EventType":"Sleeping","StartTi
      me":"2016-04-09T07:15:50.7544252","EndTime":"2016-04-09T13:38:01.7544252","TimeOfDay":"0001-01-01T00:00:00Z","CaloriesBurned":397,"DayId":"2016-04-08T00:00:00Z","Feeling":"Unknown","AverageHeartRate
      ":88,"LowestHeartRate":59,"PeakHeartRate":116,"Flags":1,"TimeZoneOffsetMinutes":-240,"UsedAsEvidence":true,"UvExposure":0,"Tags":[


      ],"PropertyBag":null,"UserFirstName":null,"AwakeTime":898,"SleepTime":22033,"NumberOfWakeups":2,"TimeToFallAsleep":299,"SleepEfficiencyPercentage":97,"SleepRecoveryIndex":10,"RestingHeartRate":73,"T
      otalRestfulSleep":6972,"TotalRestlessSleep":15061,"SleepTimeline":[
        {
          "RestType":"Awake","Seconds":269
        },{
          "RestType":"LightSleep","Seconds":1616
        },{
          "RestType":"Awake","Seconds":149
        },{
          "RestType":"LightSleep","Seconds":748
        },{
          "RestType":"DeepSleep","Seconds":2544
        },{
          "RestType":"LightSleep","Seconds":568
        },{
          "RestType":"Awake","Seconds":209
        },{
          "RestType":"LightSleep","Seconds":5029
        },{
          "RestType":"DeepSleep","Seconds":1466
        },{
          "RestType":"LightSleep","Seconds":2694
        },{
          "RestType":"DeepSleep","Seconds":1436
        },{
          "RestType":"LightSleep","Seconds":3891
        },{
          "RestType":"DeepSleep","Seconds":1526
        },{
          "RestType":"LightSleep","Seconds":628
        },{
          "RestType":"Awake","Seconds":149
        }
      ],"FallAsleepTime":"2016-04-09T07:20:49.7544252","WakeUpTime":"2016-04-09T13:35:32.2034252","IsAutoDetected":false,"SleepRestorationMsg":"Low","SleepRestoration":"Low"
    }
  ]
}
```


Raw sleep data from app mobile device

Microsoft Health - website



Sleep data viewed on Microsoft Health website

NOTE: Asleep at 12:04AM

Microsoft Health app

Sleep data viewed on Microsoft Health app

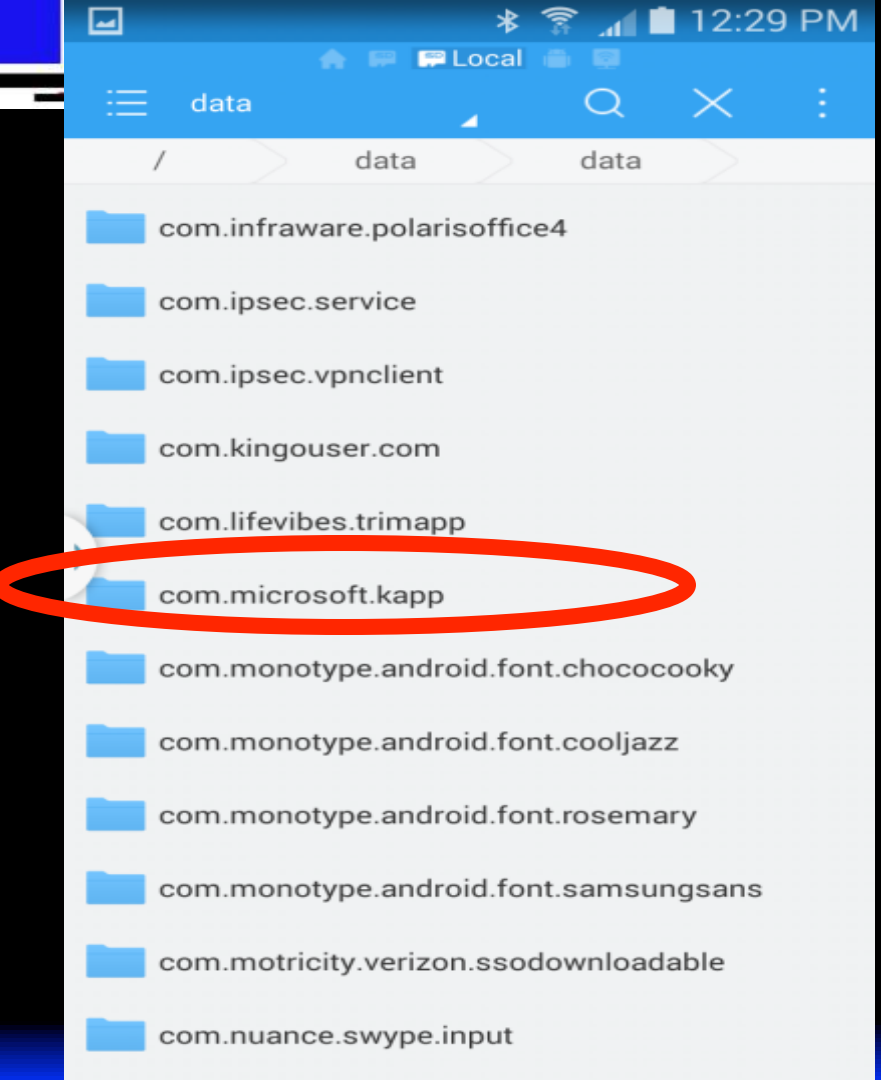
NOTE: Asleep at 12:05 AM

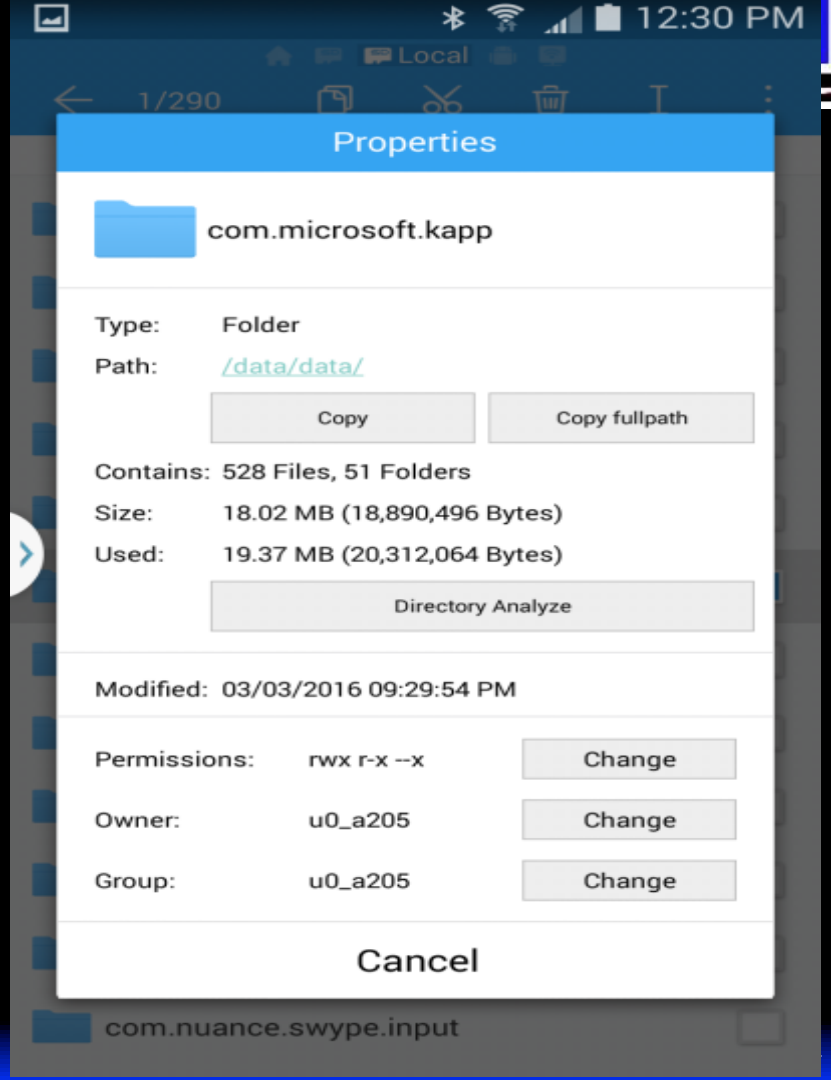
Microsoft Band 2 Specs

- Processor: ARM Cortex M4 MCU CPU
- Storage: 64MB onboard storage
- AMOLED Gorilla Glass 3 screen, 12.8mm x 32mm (0.5” x 1.25”), 320 x 128 pixels, 255ppi
- Battery: Lithium Polymer battery (average battery life 48 hours)
- Bluetooth: Bluetooth 4.0
- GPS
- Source: *http://www.pcadvisor.co.uk/review/activity-trackers/microsoft-band-vs-band-2-comparison-3626883/#productSpecificationFull*

Microsoft Band 2 storage (Android mobile device)

- Path: /data/data/com.microsoft.kapp
  - Make sure it is NOT “emulated”


12:29 PM
Local
data
/
data
data
com.infraware.polarisoffice4
com.ipsec.service
com.ipsec.vpnclient
com.kingouser.com
com.lifevibes.trimapp
com.microsoft.kapp
com.monotype.android.font.chococooky
com.monotype.android.font.cooljazz
com.monotype.android.font.rosemary
com.monotype.android.font.samsungsans
com.motricity.verizon.ssodownloadable
com.nuance.swype.input


12:30 PM
Local
1/290
Properties
com.microsoft.kapp
Type: Folder
Path: /data/data/
Copy
Copy fullpath
Contains: 528 Files, 51 Folders
Size: 18.02 MB (18,890,496 Bytes)
Used: 19.37 MB (20,312,064 Bytes)
Directory Analyze
Modified: 03/03/2016 09:29:54 PM
Permissions: rwx r-x --x
Change
Owner: u0_a205
Change
Group: u0_a205
Change
Cancel
com.nuance.swype.input

Microsoft Band 2 storage (Android mobile device)

- Primary folder of interest is “responseCache”
  - Found under “com.microsoft.kapp/files”

- Folder contains files in json format with GUID type names
  - Names correlate to entries in SQLite database “cache.sqlite” found under the path “com.microsoft.kapp/databases”
  - IMPORTANT NOTE: Not all names have an entry, depending on Band usage

Microsoft Band 2 storage (Android mobile device)

- Data in SQLite database notes a file related to “Golf” is stored as “/data/data/ com.microsoft.kapp/files/responseCache/ 9524a205-d3d6-4d7c-ad31-cbfba2e25840”

Microsoft Band 2 storage (Android mobile device)

https://fusstorageprodwus.blob.core.windows.net/appconfigs/us/default.j...	/data/data/com.microsoft.kapp/files/responseCache/6e251563-c1c3-40f4-809b-abb3a7a4a154
https://prodphseus.dns-cargo.com//v1/Events(eventId=%272519450602...	/data/data/com.microsoft.kapp/files/responseCache/0d086466-39d0-4947-9bb6-3348a0e128aa
https://prodphseus.dns-cargo.com//v1/Events(eventId=%272519449793...	/data/data/com.microsoft.kapp/files/responseCache/bb615e67-4492-4bd1-9c29-e8ba9577d6e9
https://prodphseus.dns-cargo.com//v2/5d784f21-6bd2-4d9d-b9a1-8af7f8...	/data/data/com.microsoft.kapp/files/responseCache/a968921b-6320-44ce-8a6c-f4ecfcf34d71
https://prodphseus.dns-cargo.com//v1/workouts/lastsynced	/data/data/com.microsoft.kapp/files/responseCache/e21e6060-3d9a-457b-8255-a29c2a8e83b6
https://prodfus.dns-cargo.com//api/AppsConfig	/data/data/com.microsoft.kapp/files/responseCache/e5493a7d-6c9b-4ffb-9b49-95ff700624c5
https://prodphseus.dns-cargo.com//v1/Events(eventId=%272519448467...	/data/data/com.microsoft.kapp/files/responseCache/251616ba-7caa-4dce-8d8c-c7e2ef5ecbad
https://prodphseus.dns-cargo.com//v1/goals?isExpand=false	/data/data/com.microsoft.kapp/files/responseCache/ee6ed2c5-18df-43cb-9a4a-32483082a96b
https://prodphseus.dns-cargo.com//v2/UserHourlySummary(period=%27h...	/data/data/com.microsoft.kapp/files/responseCache/ce781ca5-1bc5-464a-9263-a7197d31ae0c
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Sleeping...	/data/data/com.microsoft.kapp/files/responseCache/1fc958be-7ab0-4146-8910-6a529b4d6f20
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%2...	/data/data/com.microsoft.kapp/files/responseCache/65742e96-a23d-4ea0-a2df-0bc82c652e1f
https://prodphseus.dns-cargo.com//v2/weights?top=2	/data/data/com.microsoft.kapp/files/responseCache/9f2d1e9e-2d74-4fa2-9452-0cc3329bb1c6
https://prodphseus.dns-cargo.com//v1/goals?status=1&isExpand=true&c...	/data/data/com.microsoft.kapp/files/responseCache/bdffcf44-2522-4a62-a6d8-45c059b838ad
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%2...	/data/data/com.microsoft.kapp/files/responseCache/f971a449-0796-4d85-9e97-3ac09c0bfd5d
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Workout...	/data/data/com.microsoft.kapp/files/responseCache/2db5f8a7-5be5-4e0c-9fa8-f9052b73f78c
https://prodphseus.dns-cargo.com//v1/8739fbb7-6bcf-4bb3-a217-c07b0f...	/data/data/com.microsoft.kapp/files/responseCache/daa71328-a574-4b4e-9026-065e165ed425
https://prodphseus.dns-cargo.com//v1/workouts/favorites?statusFilter=all	/data/data/com.microsoft.kapp/files/responseCache/859dfc35-0aa5-43a2-87fd-91df7e8c7e42
https://prodphseus.dns-cargo.com//v2/UserDailySummary(startDate=%2...	/data/data/com.microsoft.kapp/files/responseCache/6e4aa170-f025-40ce-a64f-d682de804255
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Golf%27)...	/data/data/com.microsoft.kapp/files/responseCache/9524a205-d3d6-4d7c-ad31-cbfba2e25840
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27GuidedW...	/data/data/com.microsoft.kapp/files/responseCache/ce17b490-d312-492b-b2b8-1fa7f64d31db
https://prodphseus.dns-cargo.com//v1/workouts/workoutState	/data/data/com.microsoft.kapp/files/responseCache/f3890ec1-2f54-4347-bd53-3faa555f9d08

9524a205-d3d6-4d7c-ad31-cbfba2e25840


```
{
  "odata.metadata":"https://prodphseus.dns-cargo.com/v1/
  $metadata#Events/Microsoft.Khronos.Cloud.Ods.Data.Entities.GolfEventDTO","value":[
    {

      "odata.type":"Microsoft.Khronos.Cloud.Ods.Data.Entities.GolfEventDTO","EventId"
      :"2519448467787097355","Duration":9858,"ParentEventId":"0","Name":null,"Deliver
      yID":0,"EventType":"Golf","StartTime":"2016-03-08T16:20:21.2902644Z","EndTime":
      "2016-03-08T19:04:39.2902644Z","TimeOfDay":"0001-01-01T00:00:00Z","CaloriesBurn
      ed":272,"DayId":"2016-03-08T00:00:00Z","Feeling":"Unknown","AverageHeartRate":7
      6,"LowestHeartRate":65,"PeakHeartRate":96,"Flags":1,"TimeZoneOffsetMinutes":0,"
      UsedAsEvidence":false,"UvExposure":128,"Tags":[

      ],"PropertyBag":null,"UserFirstName":null,"CourseID":"11184","CourseDataVersion
      ":"1","CourseName":"Walden Golf Club -
      Walden","CoursePar":71,"TotalHolesAtCourse":18,"TotalHolesPlayed":18,"TotalScor
      e":85,"ParForHolesPlayed":71,"ParOrBetterCount":10,"LongestDriveInCm":79114,"Lo
      ngestStrokeInCm":79114,"PaceOfPlayInSeconds":542,"LowestScoreOverParForHole":-4
      ,"TeeNameSelected":"White","TotalStepCount":7034,"TotalDistanceWalkedInCm":3990
      58,"GPSState":1,"TMaGEventId":"68140"
    }
  ]
}
```

Microsoft Band 2 storage (Android mobile device)

- Highlights
  - Distance is stored in “cm”
  - Par was 71
  - Total score was 85
  - Scored par or better on 10 holes

(Had a good front nine (+2), but ran into trouble on the back. Not too bad all in all considering I had a torn labrum in my hip)

Microsoft Health - website

Microsoft Health

Microsoft account What's this?

Email or phone

Password

Keep me signed in

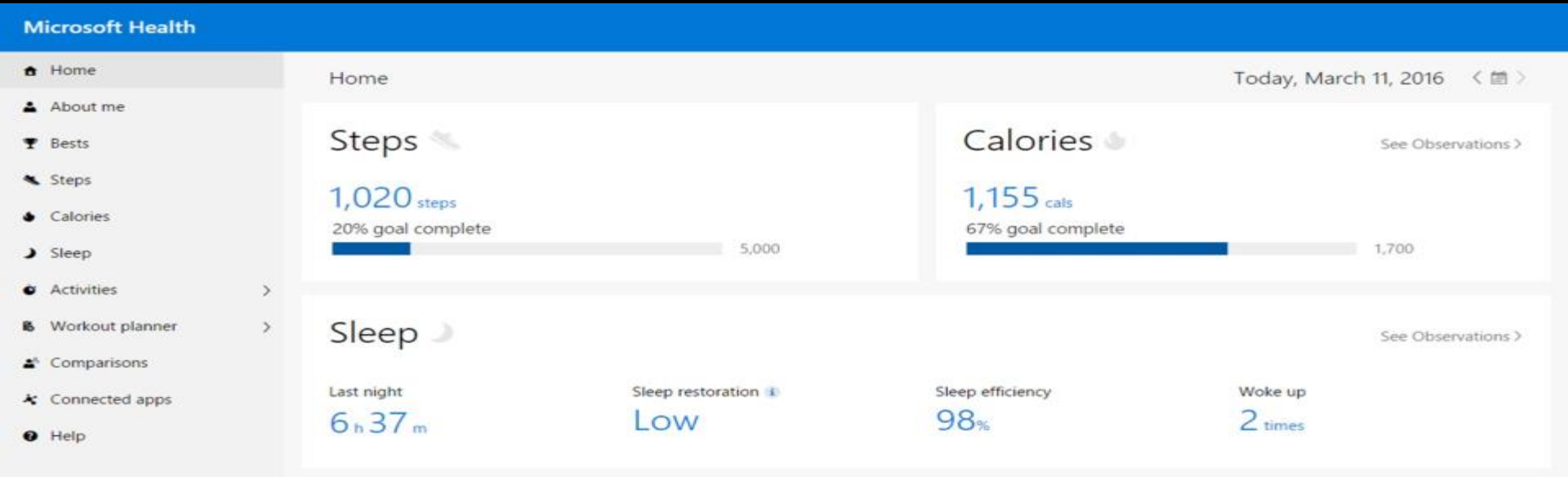
Sign in

Can't access your account?

Sign in with a single-use code

Don't have a Microsoft account? Sign up now

Microsoft Health - website

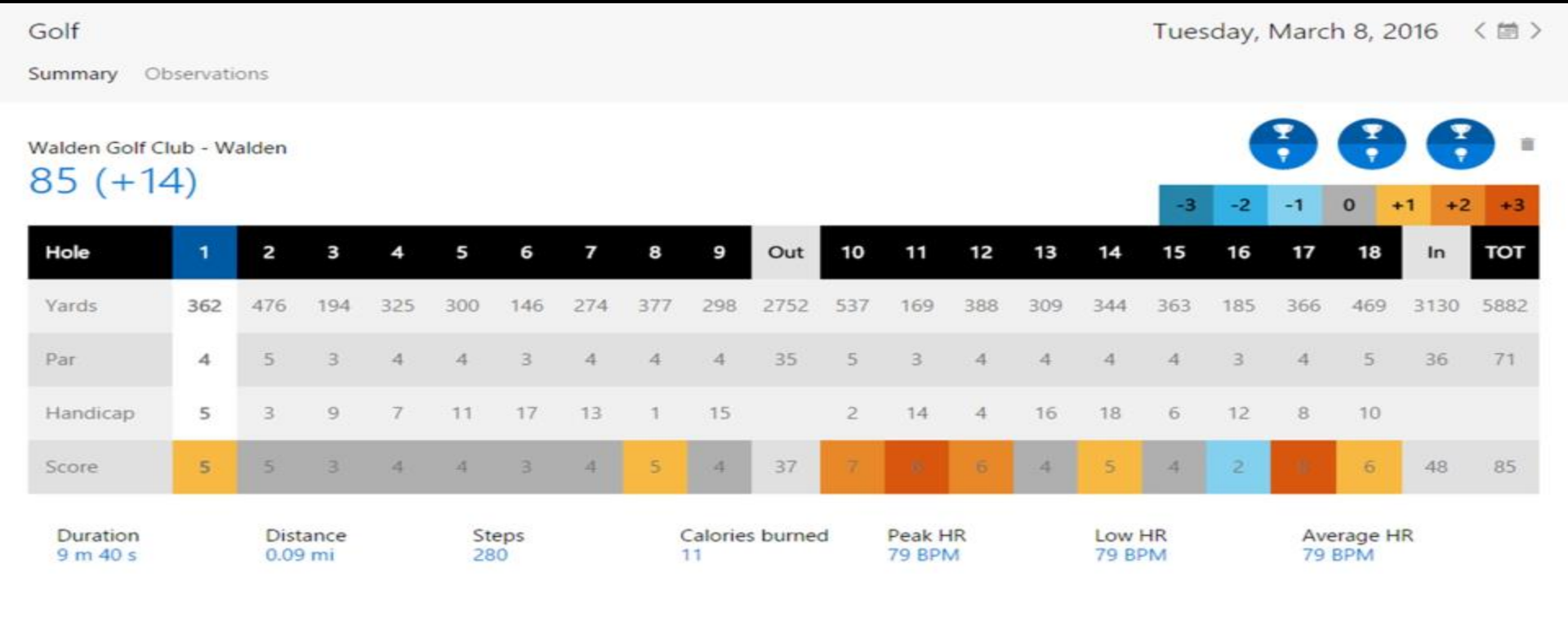


Microsoft Health - website

- Remember the text data from golfing earlier?

- The data viewed in the application or on the web is much easier to understand

Microsoft Health



Hole	1	2	3	4	5	6	7	8	9	Out	10	11	12	13	14	15	16	17	18	In	TOT
Yards	362	476	194	325	300	146	274	377	298	2752	537	169	388	309	344	363	185	366	469	3130	5882
Par	4	5	3	4	4	3	4	4	4	35	5	3	4	4	4	4	3	4	5	36	71
Handicap	5	3	9	7	11	17	13	1	15		2	14	4	16	18	6	12	8	10		
Score	5	5	3	4	4	3	4	5	4	37	7	8	6	4	5	4	2	8	6	48	85

Duration	Distance	Steps	Calories burned	Peak HR	Low HR	Average HR
9 m 40 s	0.09 mi	280	11	79 BPM	79 BPM	79 BPM

Golf data viewed on Microsoft Health website

Microsoft Health app

Golf data viewed on Microsoft Health app

Microsoft Health

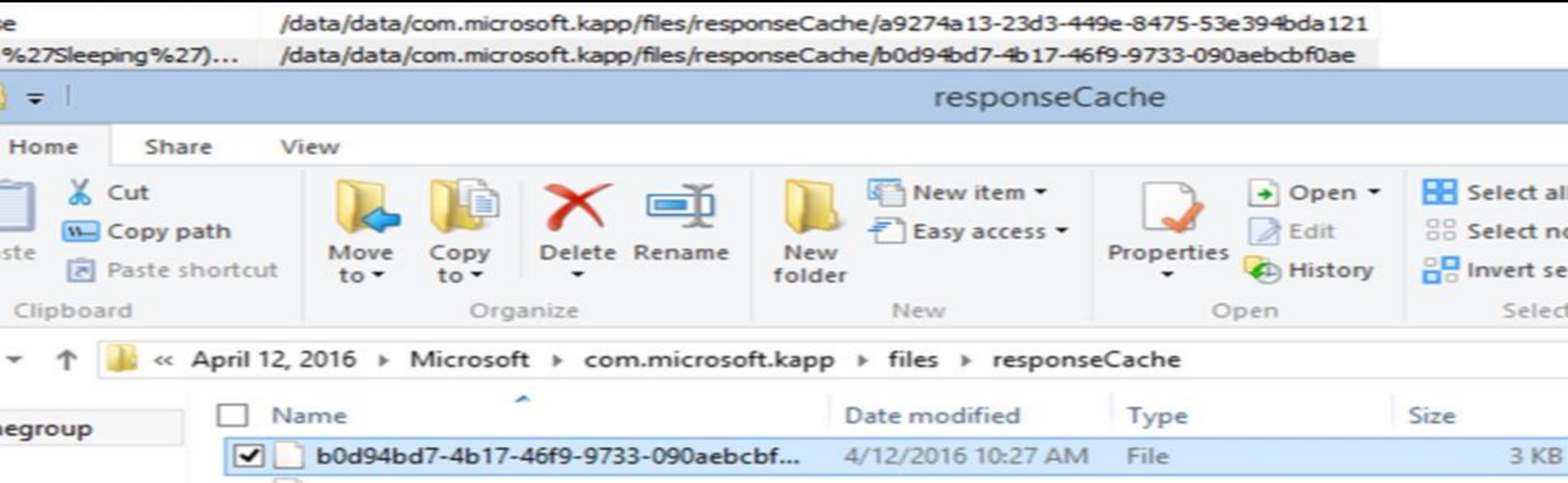
- Same methodology can be applied for all “tracking” aspects
  - Running
  - Workouts
  - Sleep
  - Calories
  - Etc.

Microsoft Band 2 storage (Android mobile device)

id	ResponseFilePath
https://prodphseus.dns-cargo.com//v1/workouts/lastsynced	/data/data/com.microsoft.kapp/files/responseCache/02a624e3-aaf0-4d4e-a74e-825080651e95
https://prodphseus.dns-cargo.com//v2/UserDailySummary(startDate=%27201...	/data/data/com.microsoft.kapp/files/responseCache/08d5b958-ad91-46f4-9fe5-f99ddfe1a0d1
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Workout%27)...	/data/data/com.microsoft.kapp/files/responseCache/16cd7eb2-cdf7-4f35-8a6d-e04967b51cad
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%27160...	/data/data/com.microsoft.kapp/files/responseCache/16f5d144-c081-4a02-99ee-2596f7f51587
https://prodphseus.dns-cargo.com//v2/UserHourlySummary(period=%27h%27...	/data/data/com.microsoft.kapp/files/responseCache/43ddfe1b-15eb-492c-8f38-a75aafbcc4b3
https://prodphseus.dns-cargo.com//v1/8739fbb7-6bcf-4bb3-a217-c07b0f54ee...	/data/data/com.microsoft.kapp/files/responseCache/62f865c9-6316-4405-84fd-c6759ffc7908
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Golf%27)?$to...	/data/data/com.microsoft.kapp/files/responseCache/7415c536-0cb2-4c58-9308-7c24b75ef1fb
https://prodphseus.dns-cargo.com//v1/goals?status=1&isExpand=true&categ...	/data/data/com.microsoft.kapp/files/responseCache/7a8c1144-e6b0-4a00-a373-731240d4b26d
https://prodphseus.dns-cargo.com//v1/8739fbb7-6bcf-4bb3-a217-c07b0f54ee...	/data/data/com.microsoft.kapp/files/responseCache/941d1acb-9187-4e03-92e8-0707cf8d3921
https://prodphseus.dns-cargo.com//v1/goals?status=1&isExpand=false&categ...	/data/data/com.microsoft.kapp/files/responseCache/9662b50c-3e72-4730-82c6-01e8a42fa286
https://prodphseus.dns-cargo.com//v1/workouts/favorites?statusFilter=all	/data/data/com.microsoft.kapp/files/responseCache/9a1825d9-058f-40eb-8e83-8076b1825c7c
https://social.microsoftband.com/api/SocialApi/TileDisplay?facebookUserId=&p...	/data/data/com.microsoft.kapp/files/responseCache/a6d9ab41-7d9b-4f24-b68f-1a21c10f4480
https://prodphseus.dns-cargo.com//v1/goals?isExpand=false	/data/data/com.microsoft.kapp/files/responseCache/a9274a13-23d3-449e-8475-53e394bda121
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27Sleeping%27)...	/data/data/com.microsoft.kapp/files/responseCache/b0d94bd7-4b17-46f9-9733-090aebcbf0ae
https://prodphseus.dns-cargo.com//v1/workouts/workoutState	/data/data/com.microsoft.kapp/files/responseCache/bbca8508-9012-44ca-b817-b33fcf1ec31a
https://prodphseus.dns-cargo.com//v2/weights?top=2	/data/data/com.microsoft.kapp/files/responseCache/d23971c1-6c06-4180-89fd-b732f32811df
https://prodphseus.dns-cargo.com//v1/Events(selectedSplitDistance=%27160...	/data/data/com.microsoft.kapp/files/responseCache/e7d79d39-49fc-48e3-8285-66f12337224c
https://prodphseus.dns-cargo.com//v1/Events(eventType=%27GuidedWorkou...	/data/data/com.microsoft.kapp/files/responseCache/e93fac7b-2278-4ba0-86de-7128801ccbe5

Look at database for file associated with “Sleeping”
b0d94bd7-4b17-46f9-9733-090aebcbf0ae

Microsoft Band 2 storage (Android mobile device)



Browse to “com.microsoft.kapp/files/responseCache/b0d94bd7-4b17-46f9-9733-090aebcbf0ae”

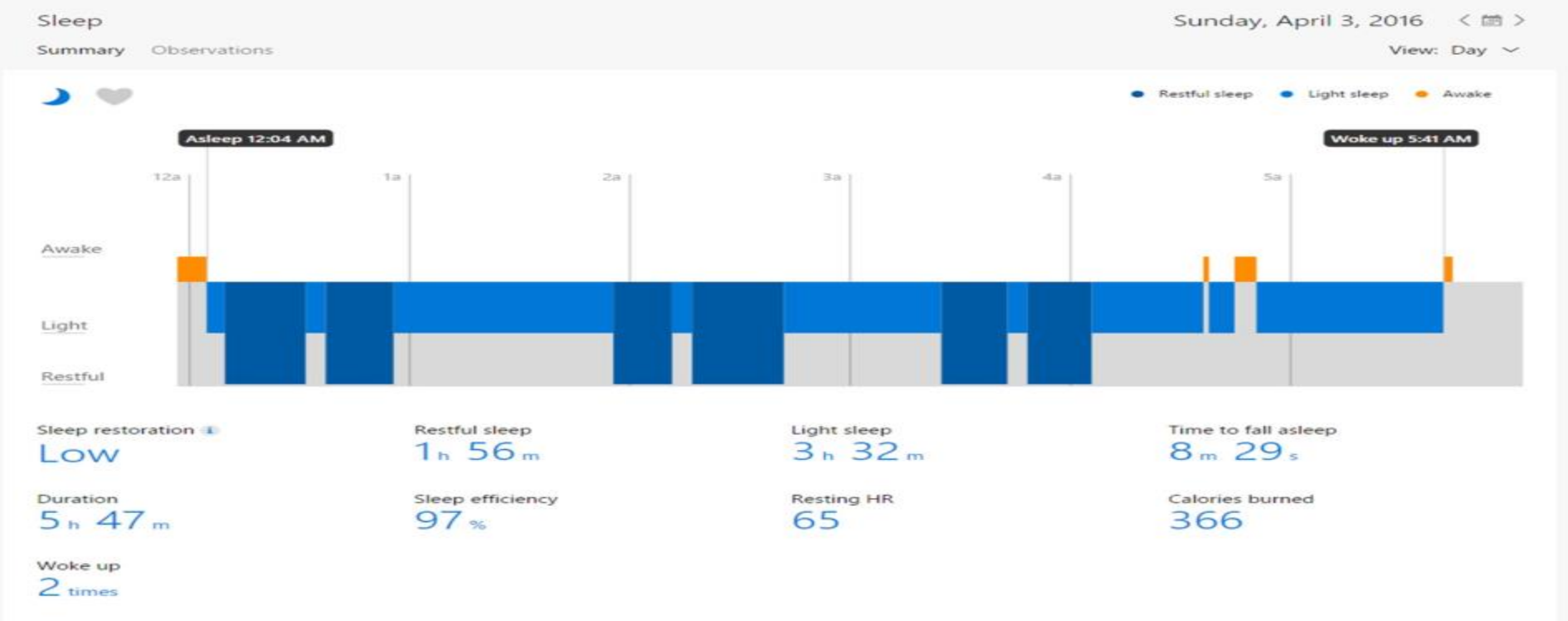
```
{
  "odata.metadata":"https://prodphoenix.dms-cargo.com/v1/$metadata#Events/Microsoft.Khronos.Cloud.Ods.Data.Entities.SleepEventDTO","value":[
    {

      "odata.type":"Microsoft.Khronos.Cloud.Ods.Data.Entities.SleepEventDTO","EventId":"2519421146492455749","Duration":22931,"ParentEventId":"0","Name":null,"DeliveryID":0,"EventType":"Sleeping","StartTi
      me":"2016-04-09T07:15:50.7544252","EndTime":"2016-04-09T13:38:01.7544252","TimeOfDay":"0001-01-01T00:00:00Z","CaloriesBurned":397,"DayId":"2016-04-08T00:00:00Z","Feeling":"Unknown","AverageHeartRate
      ":88,"LowestHeartRate":59,"PeakHeartRate":116,"Flags":1,"TimeZoneOffsetMinutes":-240,"UsedAsEvidence":true,"UvExposure":0,"Tags":[


      ],"PropertyBag":null,"UserFirstName":null,"AwakeTime":898,"SleepTime":22033,"NumberOfWakeups":2,"TimeToFallAsleep":299,"SleepEfficiencyPercentage":97,"SleepRecoveryIndex":10,"RestingHeartRate":73,"T
      otalRestfulSleep":6972,"TotalRestlessSleep":15061,"SleepTimeline":[
        {
          "RestType":"Awake","Seconds":269
        },{
          "RestType":"LightSleep","Seconds":1616
        },{
          "RestType":"Awake","Seconds":149
        },{
          "RestType":"LightSleep","Seconds":748
        },{
          "RestType":"DeepSleep","Seconds":2544
        },{
          "RestType":"LightSleep","Seconds":568
        },{
          "RestType":"Awake","Seconds":209
        },{
          "RestType":"LightSleep","Seconds":5029
        },{
          "RestType":"DeepSleep","Seconds":1466
        },{
          "RestType":"LightSleep","Seconds":2694
        },{
          "RestType":"DeepSleep","Seconds":1436
        },{
          "RestType":"LightSleep","Seconds":3891
        },{
          "RestType":"DeepSleep","Seconds":1526
        },{
          "RestType":"LightSleep","Seconds":628
        },{
          "RestType":"Awake","Seconds":149
        }
      ],"FallAsleepTime":"2016-04-09T07:20:49.7544252","WakeUpTime":"2016-04-09T13:35:32.2034252","IsAutoDetected":false,"SleepRestorationMsg":"Low","SleepRestoration":"Low"
    }
  ]
}
```


Raw sleep data on mobile device

Microsoft Health - website



Sleep data viewed on Microsoft Health website

NOTE: Asleep at 12:04AM

Microsoft Health app

Sleep data viewed on Microsoft Health app

NOTE: Asleep at 12:05 AM

Future development (DEPENDENT ON FREE TIME)

- Check out a post by b0nb0n on jailbreaking the Microsoft fitness band
  - http://www.b0n0n.com/2016/04/20/ms-jailbreak/

- *NOTE: This was done with the original Microsoft Band, my limited testing has been unsuccessful thus far on the Band 2*