

SherLock Dataset

Data Field Descriptions

v2.4.1

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Overview – Each table of the Sherlock Dataset can be downloaded separately as a TSV file. Due to its size, the dataset can be downloaded in slices per quarter year of data collection. The Table below shows the quarters currently available for download and their approximate sizes. Note that the applications table has been compressed into a 7zip file for portability.

Year	Quarter	Start Date	End Date	Download Size	Unpacked size
2015	Q1	January 1, 2015	April 1, 2015	5.23 GB	80.5 GB
2015	Q2	April 1, 2015	July 1, 2015	99.9 GB	341.7 GB
2015	Q3	July 1, 2015	October 1, 2015	79.2 GB	340.4 GB
2015	Q4	October 1, 2015	January 1, 2016	81.6 GB	452.2 GB
2016	Q1	January 1, 2016	April 1, 2016	116 GB	627.3 GB
2016	Q2	April 1, 2016	July 1, 2016	100 GB	678.8 GB
2016	Q3	July 1, 2016	October 1, 2016	98.4 GB	505.4 GB
2016	Q4	October 1, 2016	January 1, 2017	-	-

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PUSH Sensor Tables

Call Log: Sampled upon event of an in or out going call

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **address** [string]: Salted Hash of phone number (incoming or outgoing)
- **date** [int]: Unix timestamp of when this call took place.
- **duration** [int]: Duration of call in seconds.
- **fromcontacts** [bool]: True if address exists in user's contacts.
- **type** [{1,2,3,4}]: 1=incoming, 2=outgoing, 3=missed call, 4=voice mail.

SMS Log: Sampled upon event of an in or out going SMS

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **address** [string]: Salted Hash of phone number (incoming or outgoing)
- **containsURL** [bool]: True if the SMS contains a URL
- **date** [int]: Unix timestamp of when this call took place.
- **fromcontacts** [bool]: True if address exists in user's contacts.
- **type** [{1,2}]: 1=incoming, 2=outgoing.

Screen Status: Sampled upon event of the screen turning [on](#) or [off](#).

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **screenon** [bool]: True if this is an ON event, False if it was an OFF event.
- **timestamp** [string]: Datetime timestamp of event occurrence.

User Presence: Sampled upon event of user [presence event](#) (when the user begins to interact with the device).

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **timestamp** [string]: Datetime timestamp of event occurrence.

Broadcast Intents: Sampled when an [Android broadcast intent](#) is triggered.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **extras** [string]: Key-value pairs that carry additional information required to accomplish the requested action. Just as some actions use particular kinds of data URIs, some actions also use particular extras.
- **timestamp** [string]: Datetime timestamp of event occurrence.
- **action** [string]: this is the action that took place and is being reported. The action largely determines how the rest of the intent is structured—particularly what is contained in the data and extras.

The following are the observed broadcast intents:

- android.app.action.ACTION_PASSWORD_CHANGED
- android.app.action.ACTION_PASSWORD_EXPIRING
- android.app.action.ACTION_PASSWORD_FAILED
- android.app.action.ACTION_PASSWORD_SUCCEEDED
- android.app.action.DEVICE_ADMIN_DISABLED
- android.app.action.DEVICE_ADMIN_DISABLE_REQUESTED
- android.app.action.DEVICE_ADMIN_ENABLED
- android.bluetooth.a2dp.profile.action.CONNECTION_STATE_CHANGED

- android.bluetooth.a2dp.profile.action.PLAYING_STATE_CHANGED
- android.bluetooth.adapter.action.CONNECTION_STATE_CHANGED
- android.bluetooth.adapter.action.DISCOVERY_FINISHED
- android.bluetooth.adapter.action.DISCOVERY_STARTED
- android.bluetooth.adapter.action.LOCAL_NAME_CHANGED
- android.bluetooth.adapter.action.SCAN_MODE_CHANGED
- android.bluetooth.adapter.action.STATE_CHANGED
- android.bluetooth.device.action.ACL_CONNECTED
- android.bluetooth.device.action.ACL_DISCONNECTED
- android.bluetooth.device.action.ACL_DISCONNECT_REQUESTED
- android.bluetooth.device.action.BOND_STATE_CHANGED
- android.bluetooth.device.action.CLASS_CHANGED
- android.bluetooth.device.action.FOUND
- android.bluetooth.device.action.NAME_CHANGED
- android.bluetooth.device.action.UUID
- android.bluetooth.devicepicker.action.DEVICE_SELECTED
- android.bluetooth.devicepicker.action.LAUNCH
- android.bluetooth.headset.action.VENDOR_SPECIFIC_HEADSET_EVENT
- android.bluetooth.headset.profile.action.AUDIO_STATE_CHANGED
- android.bluetooth.headset.profile.action.CONNECTION_STATE_CHANGED
- android.bluetooth.input.profile.action.CONNECTION_STATE_CHANGED
- android.bluetooth.pan.profile.action.CONNECTION_STATE_CHANGED
- android.hardware.action.NEW_VIDEO
- android.hardware.action.NEW_PICTURE
- android.hardware.input.action.QUERY_KEYBOARD_LAYOUTS
- android.intent.action.ACTION_POWER_CONNECTED
- android.intent.action.ACTION_POWER_DISCONNECTED
- android.intent.action.ACTION_SHUTDOWN
- android.intent.action.AIRPLANE_MODE
- android.intent.action.BATTERY_LOW
- android.intent.action.BATTERY_OKAY
- android.intent.action.BOOT_COMPLETED
- android.intent.action.CAMERA_BUTTON
- android.intent.action.CONFIGURATION_CHANGED
- android.intent.action.DATE_CHANGED
- android.intent.action.DEVICE_STORAGE_LOW
- android.intent.action.DEVICE_STORAGE_OK
- android.intent.action.DOCK_EVENT
- android.intent.action.DREAMING_STARTED
- android.intent.action.DREAMING_STOPPED
- android.intent.action.EXTERNAL_APPLICATIONS_AVAILABLE
- android.intent.action.EXTERNAL_APPLICATIONS_UNAVAILABLE
- android.intent.action.FETCH_VOICEMAIL
- android.intent.action.GTALK_CONNECTED
- android.intent.action.GTALK_DISCONNECTED
- android.intent.action.HEADSET_PLUG
- android.intent.action.INPUT_METHOD_CHANGED
- android.intent.action.LOCALE_CHANGED
- android.intent.action.MANAGE_PACKAGE_STORAGE

- android.intent.action.MEDIA_BAD_REMOVAL
- android.intent.action.MEDIA_BUTTON
- android.intent.action.MEDIA_CHECKING
- android.intent.action.MEDIA_EJECT
- android.intent.action.MEDIA_MOUNTED
- android.intent.action.MEDIA_NOFS
- android.intent.action.MEDIA_REMOVED
- android.intent.action.MEDIA_SCANNER_FINISHED
- android.intent.action.MEDIA_SCANNER_SCAN_FILE
- android.intent.action.MEDIA_SCANNER_STARTED
- android.intent.action.MEDIA_SHARED
- android.intent.action.MEDIA_UNMOUNTABLE
- android.intent.action.MEDIA_UNMOUNTED
- android.intent.action.MY_PACKAGE_REPLACED
- android.intent.action.NEW_OUTGOING_CALL
- android.intent.action.NEW_VOICEMAIL
- android.intent.action.PACKAGE_ADDED
- android.intent.action.PACKAGE_CHANGED
- android.intent.action.PACKAGE_DATA_CLEARED
- android.intent.action.PACKAGE_FIRST_LAUNCH
- android.intent.action.PACKAGE_FULLY_REMOVED
- android.intent.action.PACKAGE_INSTALL
- android.intent.action.PACKAGE_NEEDS_VERIFICATION
- android.intent.action.PACKAGE_REMOVED
- android.intent.action.PACKAGE_REPLACED
- android.intent.action.PACKAGE_RESTARTED
- android.intent.action.PACKAGE_VERIFIED
- android.intent.action.PHONE_STATE
- android.intent.action.PROVIDER_CHANGED
- android.intent.action.PROXY_CHANGE
- android.intent.action.REBOOT
- android.intent.action.TIMEZONE_CHANGED
- android.intent.action.TIME_SET
- android.intent.action.UID_REMOVED
- android.intent.action.WALLPAPER_CHANGED
- android.media.ACTION_SCO_AUDIO_STATE_UPDATED
- android.media.AUDIO_BECOMING_NOISY
- android.media.RINGER_MODE_CHANGED
- android.media.SCO_AUDIO_STATE_CHANGED
- android.media.VIBRATE_SETTING_CHANGED
- android.media.action.CLOSE_AUDIO_EFFECT_CONTROL_SESSION
- android.media.action.OPEN_AUDIO_EFFECT_CONTROL_SESSION
- android.net.conn.BACKGROUND_DATA_SETTING_CHANGED
- android.net.nsd.STATE_CHANGED
- android.net.wifi.NETWORK_IDS_CHANGED
- android.net.wifi.RSSI_CHANGED
- android.net.wifi.STATE_CHANGE
- android.net.wifi.p2p.CONNECTION_STATE_CHANGE
- android.net.wifi.p2p.DISCOVERY_STATE_CHANGE

- android.net.wifi.p2p.PEERS_CHANGED
- android.net.wifi.p2p.STATE_CHANGED
- android.net.wifi.p2p.THIS_DEVICE_CHANGED
- android.net.wifi.suplicant.CONNECTION_CHANGE
- android.net.wifi.suplicant.STATE_CHANGE
- android.speech.tts.TTS_QUEUE_PROCESSING_COMPLETED
- android.speech.tts.engine.TTS_DATA_INSTALLED
- android.net.conn.CONNECTIVITY_CHANGE

App Packages: Sampled when an application has been altered.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **action** [{Added, Changed, Removed, Updated, NULL}]: The action occurring to the indicated application. NULL means that this record is was sampled as a probe and not because of some event.
- **appPackage** [string]: The Android app package name (e.g. com.android.email).
- **appuid** [int]: The [identifier](#) assigned to this application by the OS.
- **app_name** [string]: The name of the application.
- **installsrc** [string]: The source of the incurred alteration.
- **installtime** [int]: Unix timestamp in milliseconds to when the application was installed.
- **packagehash** [string]: The SHA1 hash of the application's APK. Compatible with [VirusTotal](#).
- **permissions** [string]: A list of all [system permissions](#) requested by the application.
- **versionname** [string]: Version name of the application.
- **versioncode** [int]: Version code of the application.
- **sherlock_version** [string]: The current version of the Sherlock collection agent running on the device.

Moriarty Probe: Sampled when a Clue is recorded by the Moriarty malicious agent. See further documentation [here](#).

- **userid** [string]: the user ID to whom this sample belongs to.
- **uid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The version of Moriarty this clue belongs to.
- **action** [string]: The general action being performed by the Moriarty agent.
- **actionType** [{benign, malicious}]: The intent of the action being performed.
- **details** [string]: Details on the action performed. This field may contain additional information. The format of this field is:
 <details> (<data field>;...);<data value>;...
 e.g.: "Successful send to server(duration [msec],size [bytes]);440;20731"
- **sessionID** [int]: The ID for the on going session to which this clue belongs.
- **sessionType** [{benign, malicious}]: The intent of the ongoing session.
- **behavior** [string]: Sometimes sessions may overlap (e.g. benign game playing and a spyware service). This field help segregate overlapping sessions and identify their intents.

PULL Sensor Tables

T0: Sampled once every 24 hours, and when the Sherlock agent restarts.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **telephony_deviceid** [string]: Salted hash of the device's telephone ID
- **telephony_devicesoftwareversion** [string]: the software version number for the device, for example, the IMEI/SV for GSM phones. null if the software version is not available.

- **telephony_networkcountryiso** [string]: the ISO country code equivalent of the current registered operator's MCC (Mobile Country Code).
- **telephony_networkoperator** [string]: Salted hash of the numeric name (MCC+MNC) of current registered operator.
- **telephony_networkoperatorname** [string]: Salted hash of the alphabetic name of current registered network operator.
- **telephony_networktype** [int]: The connected mobile network type. See the enums listed [here](#).
- **telephony_phonetype** [int]: An enum indicating the phone's type: none, GSM, CDMA, SIP,...
- **telephony_simcountryiso** [string]: The ISO country code equivalent for the SIM provider's country code.
- **telephony_simoperator** [string]: Salted Hash of the MCC+MNC (mobile country code + mobile network code) of the provider of the SIM. 5 or 6 decimal digits.
- **telephony_simoperatorname** [string]: Salted hash of the alphabetic name of current registered operator.
- **telephony_simserialnumber** [string]: Salted hash of the SIM's serial number.
- **telephony_simstate** [int]: constant [indicating](#) the state of the default SIM card.
- **telephony_subscriberid** [int]: Salted hash of the unique subscriber ID, for example, the IMSI for a GSM phone. null if it is unavailable.
- **telephony_hassiccard** [bool]: True if the calling application has been granted carrier privileges by the carrier. If any of the packages in the calling UID has carrier privileges, the call will return true. This access is granted by the owner of the UICC card and does not depend on the registered carrier.
- **telephony_timestamp** [string]: Datetime timestamp of this sample.
- **hardware_wifimac** [string]: Salted hash of WiFi card's MAC address.
- **hardware_bluetoothmac** [string]: Salted hash of Bluetooth card's MAC address.
- **hardware_androidid** [string]: A [64-bit number](#) (as a hex string) that is randomly generated when the user first sets up the device and should remain constant for the lifetime of the user's device. The value may change if a factory reset is performed on the device.
- **hardware_brand** [string]: Brand of device (e.g. Samsung)
- **hardware_model** [string]: Model of device (e.g. SM-G900F)
- **hardware_deviceid** [string]: Salted hash of device serial number.
- **systeminfo_os_version** [string]: version of Android OS.
- **systeminfo_baseband_version** [string]: Version of baseband firmware.
- **systeminfo_sdk** [string]: Device SDK (API level)
- **systeminfo_kernelinfo** [string]: Kernel version as appeared in About Phone in Settings
- **systeminfo_timestamp** [string]: Datetime timestamp of this sample.

T1: Sampled once every minute (0.0167 Hz).

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **googleplayloc_speed** [string]: The speed of the device, if it is available, in meters/second over ground.
- **googleplayloc_maccuracy** [string]: The estimated accuracy of the detected location, in meters.
- **googleplayloc_timestamp** [string]: Datetime timestamp of when the location was sampled.
- **celltower_cid** [string]: A salted hash of the connected cell tower's ID.
- **celltower_lac** [string]: A salted hash of the connected cell tower's Location Area Code (LAC).
- **celltower_psc** [string]: A salted hash of the connected cell tower's Primary Scrambling Code (PSC).
- **celltower_timestamp** [string]: Datetime timestamp of when the cell information was sampled.

- **celltower_type** [string]:
- **status_alarmvol** [int]: The volume of the set alarm.
- **status_brightnessmode** [string]: The setting for screen brightness (e.g. manual / automatic)
- **status_brightness_file** [string]: Actual brightness (can be different from the above in auto mode).
- **status_brightness_settings** [string]: The brightness set by the user.
- **status_dtmfvol** [int]: The volume for the sounds used for touch tone dialing.
- **status_musicvol** [int]: Media volume level.
- **status_notificationvol** [int]: Notification volume level.
- **status_orientation** [string]: Screen orientation (e.g., landscape / portrait)
- **status_ringermode** [string]: Android [ringer mode](#) (e.g. normal / silent / vibrate)
- **status_ringtonevol** [int]: Volume of the ringtone.
- **status_systemvol** [int]: System volume.
- **status_voicecallvol** [int]: Call volume.
- **status_timestamp** [string]: Datetime timestamp of when the status information was sampled.
- **location_spatio_5means** [int]: The cluster ID of the device's location, from a 5-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatio_10means** [int]: The cluster ID of the device's location, from a 10-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatio_25means** [int]: The cluster ID of the device's location, from a 25-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatio_50means** [int]: The cluster ID of the device's location, from a 50-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatio_75means** [int]: The cluster ID of the device's location, from a 75-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatio_100means** [int]: The cluster ID of the device's location, from a 100-means clustering of the longitude and latitude (received from the Google Play Location API).
- **location_spatioTemporal_day_5means** [int]: The cluster ID of the device's location, from a 5-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{hourOfDay}/24))$, $y = \sin(2\pi * (\text{hourOfDay}/24))$).
- **location_spatioTemporal_day_25means** [int]: The cluster ID of the device's location, from a 25-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{hourOfDay}/24))$, $y = \sin(2\pi * (\text{hourOfDay}/24))$).
- **location_spatioTemporal_day_100means** [int]: The cluster ID of the device's location, from a 100-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{hourOfDay}/24))$, $y = \sin(2\pi * (\text{hourOfDay}/24))$).
- **location_spatioTemporal_week_5means** [int]: The cluster ID of the device's location, from a 5-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{dayOfWeek}/7))$, $y = \sin(2\pi * (\text{dayOfWeek}/7))$).
- **location_spatioTemporal_week_25means** [int]: The cluster ID of the device's location, from a 25-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{dayOfWeek}/7))$, $y = \sin(2\pi * (\text{dayOfWeek}/7))$).
- **location_spatioTemporal_week_100means** [int]: The cluster ID of the device's location, from a 100-means clustering of the longitude, latitude, and cyclic representation of the time of day ($x = \cos(2\pi * (\text{dayOfWeek}/7))$, $y = \sin(2\pi * (\text{dayOfWeek}/7))$).

WiFi: Probe activated with T1 (once a minute). A record is made for *each* WiFi access point visible.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.

- **ssid** [string]: A salted hash of the SSID (network name) of the detected Wi-Fi access point
- **capabilities** [string]: Describes the authentication, key management, and encryption schemes supported by the access point.
- **freq** [string]: The primary 20 MHz frequency (in MHz) of the channel over which the client is communicating with the access point.
- **level** [string]: The detected signal level in dBm, also known as the RSSI.

Bluetooth: Probe activated with T1 (once a minute). A record is made for each Bluetooth device visible.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **bluetooth_appearance** [int]: The [external appearance](#) of this device (phone, computer etc...)
- **bluetooth_class** [int]: Represents the detected device's [Bluetooth class](#), which describes general characteristics and capabilities of a device. For example, a Bluetooth class will specify the general device type such as a phone, a computer, or headset, and whether it's capable of services such as audio or telephony.
- **bluetooth_maddress** [string]: Salted hash of the detected device's MAC address.
- **bluetooth_mremotebrsf**: Depreciated
- **bluetooth_mvaluenrec**: Depreciated
- **bluetooth_mvaluewbs**: Depreciated
- **bluetooth_name** [string]: Salted hash of the detected device's name.
- **bluetooth_rssi** [int]: The detected device's signal level in dBm.
- **bluetooth_timestamp** [string]: Datetime timestamp of this sample.

T2: Probe activated once every 15 seconds (0.0667 Hz), records all sensors for 4 seconds at 200 Hz into the temporary array X. Then X is processed then to create a single record with the fields below. The units are based on the [Android Motion Sensor API](#). FFT size is 512 samples. All computations on the FFT are on the first 256 components without the DC component.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **timestamp** [string]: Datetime timestamp of this sample.
- **accelerometerstat_x_dc_fft** [float]: The DC component of the FFT on the accelerometer x-axis.
- **accelerometerstat_x_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the accelerometer x-axis.
- **accelerometerstat_x_first_val_fft** [float]: The energy of the strongest FFT component on the accelerometer x-axis.
- **accelerometerstat_x_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the accelerometer x-axis.
- **accelerometerstat_x_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the accelerometer x-axis.
- **accelerometerstat_x_mean** [float]: The average acceleration across the sampled accelerometer x-axis values.
- **accelerometerstat_x_mean_fft** [float]: The average energy across the FFT components on the accelerometer x-axis.
- **accelerometerstat_x_median** [float]: The median acceleration across the sampled accelerometer x-axis values.
- **accelerometerstat_x_median_fft** [float]: The median FFT value (energy) across the x-axis frequencies.
- **accelerometerstat_x_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the accelerometer x-axis.
- **accelerometerstat_x_second_val_fft** [float]: The energy of the second strongest FFT component on the accelerometer x-axis.

- **accelerometerstat_x_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the accelerometer x-axis.
- **accelerometerstat_x_third_val_fft** [float]: The energy of the third strongest FFT component on the accelerometer x-axis.
- **accelerometerstat_x_var** [float]: The variance of the acceleration across the sampled accelerometer x-axis values.
- **accelerometerstat_x_var_fft** [float]: The variance of the FFT values obtained from accelerometer x-axis frequencies.
- **accelerometerstat_y_dc_fft** [float]: The DC component of the FFT on the accelerometer y-axis.
- **accelerometerstat_y_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the accelerometer y-axis.
- **accelerometerstat_y_first_val_fft** [float]: The energy of the strongest FFT component on the accelerometer y-axis.
- **accelerometerstat_y_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the accelerometer y-axis.
- **accelerometerstat_y_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the accelerometer y-axis.
- **accelerometerstat_y_mean** [float]: The average acceleration across the sampled accelerometer y-axis values.
- **accelerometerstat_y_mean_fft** [float]: The average energy across the FFT components on the accelerometer y-axis.
- **accelerometerstat_y_median** [float]: The median acceleration across the sampled accelerometer y-axis values.
- **accelerometerstat_y_median_fft** [float]: The median FFT value (energy) across the y-axis frequencies.
- **accelerometerstat_y_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the accelerometer y-axis.
- **accelerometerstat_y_second_val_fft** [float]: The energy of the second strongest FFT component on the accelerometer y-axis.
- **accelerometerstat_y_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the accelerometer y-axis.
- **accelerometerstat_y_third_val_fft** [float]: The energy of the third strongest FFT component on the accelerometer y-axis.
- **accelerometerstat_y_var** [float]: The variance of the acceleration across the sampled accelerometer y-axis values.
- **accelerometerstat_y_var_fft** [float]: The variance of the FFT values obtained from accelerometer y-axis frequencies.
- **accelerometerstat_z_dc_fft** [float]: The DC component of the FFT on the accelerometer z-axis.
- **accelerometerstat_z_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the accelerometer z-axis.
- **accelerometerstat_z_first_val_fft** [float]: The energy of the strongest FFT component on the accelerometer z-axis.
- **accelerometerstat_z_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the accelerometer z-axis.
- **accelerometerstat_z_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the accelerometer z-axis.
- **accelerometerstat_z_mean** [float]: The average acceleration across the sampled accelerometer z-axis values.
- **accelerometerstat_z_mean_fft** [float]: The average energy across the FFT components on the accelerometer z-axis.
- **accelerometerstat_z_median** [float]: The median acceleration across the sampled accelerometer z-axis values.
- **accelerometerstat_z_median_fft** [float]: The median FFT value (energy) across the z-axis frequencies.

- **accelerometerstat_z_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the accelerometer z-axis.
- **accelerometerstat_z_second_val_fft** [float]: The energy of the second strongest FFT component on the accelerometer z-axis.
- **accelerometerstat_z_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the accelerometer z-axis.
- **accelerometerstat_z_third_val_fft** [float]: The energy of the third strongest FFT component on the accelerometer z-axis.
- **accelerometerstat_z_var** [float]: The variance of the acceleration across the sampled accelerometer z-axis values.
- **accelerometerstat_z_var_fft** [float]: The variance of the FFT values obtained from accelerometer z-axis frequencies.
- **accelerometerstat_cov_y_x** [float]: The y-x covariance of the sampled accelerometer values.
- **accelerometerstat_cov_z_x** [float]: The z-x covariance of the sampled accelerometer values.
- **accelerometerstat_cov_z_y** [float]: The z-y covariance of the sampled accelerometer values.
- **gyroscopestat_x_dc_fft** [float]: The DC component of the FFT on the gyroscope x-axis.
- **gyroscopestat_x_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the gyroscope x-axis.
- **gyroscopestat_x_first_val_fft** [float]: The energy of the strongest FFT component on the gyroscope x-axis.
- **gyroscopestat_x_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the gyroscope x-axis.
- **gyroscopestat_x_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the gyroscope x-axis.
- **gyroscopestat_x_mean** [float]: The average acceleration across the sampled gyroscope x-axis values.
- **gyroscopestat_x_mean_fft** [float]: The average energy across the FFT components on the gyroscope x-axis.
- **gyroscopestat_x_median** [float]: The median acceleration across the sampled gyroscope x-axis values.
- **gyroscopestat_x_median_fft** [float]: The median FFT value (energy) across the x-axis frequencies.
- **gyroscopestat_x_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the gyroscope x-axis.
- **gyroscopestat_x_second_val_fft** [float]: The energy of the second strongest FFT component on the gyroscope x-axis.
- **gyroscopestat_x_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the gyroscope x-axis.
- **gyroscopestat_x_third_val_fft** [float]: The energy of the third strongest FFT component on the gyroscope x-axis.
- **gyroscopestat_x_var** [float]: The variance of the acceleration across the sampled gyroscope x-axis values.
- **gyroscopestat_x_var_fft** [float]: The variance of the FFT values obtained from gyroscope x-axis frequencies.
- **gyroscopestat_y_dc_fft** [float]: The DC component of the FFT on the gyroscope y-axis.
- **gyroscopestat_y_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the gyroscope y-axis.
- **gyroscopestat_y_first_val_fft** [float]: The energy of the strongest FFT component on the gyroscope y-axis.
- **gyroscopestat_y_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the gyroscope y-axis.
- **gyroscopestat_y_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the gyroscope y-axis.
- **gyroscopestat_y_mean** [float]: The average acceleration across the sampled gyroscope y-axis values.
- **gyroscopestat_y_mean_fft** [float]: The average energy across the FFT components on the gyroscope y-axis.
- **gyroscopestat_y_median** [float]: The median acceleration across the sampled gyroscope y-axis values.
- **gyroscopestat_y_median_fft** [float]: The median FFT value (energy) across the y-axis frequencies.

- **gyroscopestat_y_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the gyroscope y-axis.
- **gyroscopestat_y_second_val_fft** [float]: The energy of the second strongest FFT component on the gyroscope y-axis.
- **gyroscopestat_y_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the gyroscope y-axis.
- **gyroscopestat_y_third_val_fft** [float]: The energy of the third strongest FFT component on the gyroscope y-axis.
- **gyroscopestat_y_var** [float]: The variance of the acceleration across the sampled gyroscope y-axis values.
- **gyroscopestat_y_var_fft** [float]: The variance of the FFT values obtained from gyroscope y-axis frequencies.
- **gyroscopestat_z_dc_fft** [float]: The DC component of the FFT on the gyroscope z-axis.
- **gyroscopestat_z_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the gyroscope z-axis.
- **gyroscopestat_z_first_val_fft** [float]: The energy of the strongest FFT component on the gyroscope z-axis.
- **gyroscopestat_z_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the gyroscope z-axis.
- **gyroscopestat_z_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the gyroscope z-axis.
- **gyroscopestat_z_mean** [float]: The average acceleration across the sampled gyroscope z-axis values.
- **gyroscopestat_z_mean_fft** [float]: The average energy across the FFT components on the gyroscope z-axis.
- **gyroscopestat_z_median** [float]: The median acceleration across the sampled gyroscope z-axis values.
- **gyroscopestat_z_median_fft** [float]: The median FFT value (energy) across the z-axis frequencies.
- **gyroscopestat_z_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the gyroscope z-axis.
- **gyroscopestat_z_second_val_fft** [float]: The energy of the second strongest FFT component on the gyroscope z-axis.
- **gyroscopestat_z_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the gyroscope z-axis.
- **gyroscopestat_z_third_val_fft** [float]: The energy of the third strongest FFT component on the gyroscope z-axis.
- **gyroscopestat_z_var** [float]: The variance of the acceleration across the sampled gyroscope z-axis values.
- **gyroscopestat_z_var_fft** [float]: The variance of the FFT values obtained from gyroscope z-axis frequencies.
- **gyroscopestat_cov_y_x** [float]: The y-x covariance of the sampled gyroscope values.
- **gyroscopestat_cov_z_x** [float]: The z-x covariance of the sampled gyroscope values.
- **gyroscopestat_cov_z_y** [float]: The z-y covariance of the sampled gyroscope values.
- **magneticfield_x_dc_fft** [float]: The DC component of the FFT on the magneticfield x-axis.
- **magneticfield_x_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the magneticfield x-axis.
- **magneticfield_x_first_val_fft** [float]: The energy of the strongest FFT component on the magneticfield x-axis.
- **magneticfield_x_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the magneticfield x-axis.
- **magneticfield_x_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the magneticfield x-axis.
- **magneticfield_x_mean** [float]: The average acceleration across the sampled magneticfield x-axis values.
- **magneticfield_x_mean_fft** [float]: The average energy across the FFT components on the magneticfield x-axis.
- **magneticfield_x_median** [float]: The median acceleration across the sampled magneticfield x-axis values.
- **magneticfield_x_median_fft** [float]: The median FFT value (energy) across the x-axis frequencies.
- **magneticfield_x_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the magneticfield x-axis.

- **magneticfield_x_second_val_fft** [float]: The energy of the second strongest FFT component on the magneticfield x-axis.
- **magneticfield_x_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the magneticfield x-axis.
- **magneticfield_x_third_val_fft** [float]: The energy of the third strongest FFT component on the magneticfield x-axis.
- **magneticfield_x_var** [float]: The variance of the acceleration across the sampled magneticfield x-axis values.
- **magneticfield_x_var_fft** [float]: The variance of the FFT values obtained from magneticfield x-axis frequencies.
- **magneticfield_y_dc_fft** [float]: The DC component of the FFT on the magneticfield y-axis.
- **magneticfield_y_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the magneticfield y-axis.
- **magneticfield_y_first_val_fft** [float]: The energy of the strongest FFT component on the magneticfield y-axis.
- **magneticfield_y_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the magneticfield y-axis.
- **magneticfield_y_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the magneticfield y-axis.
- **magneticfield_y_mean** [float]: The average acceleration across the sampled magneticfield y-axis values.
- **magneticfield_y_mean_fft** [float]: The average energy across the FFT components on the magneticfield y-axis.
- **magneticfield_y_median** [float]: The median acceleration across the sampled magneticfield y-axis values.
- **magneticfield_y_median_fft** [float]: The median FFT value (energy) across the y-axis frequencies.
- **magneticfield_y_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the magneticfield y-axis.
- **magneticfield_y_second_val_fft** [float]: The energy of the second strongest FFT component on the magneticfield y-axis.
- **magneticfield_y_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the magneticfield y-axis.
- **magneticfield_y_third_val_fft** [float]: The energy of the third strongest FFT component on the magneticfield y-axis.
- **magneticfield_y_var** [float]: The variance of the acceleration across the sampled magneticfield y-axis values.
- **magneticfield_y_var_fft** [float]: The variance of the FFT values obtained from magneticfield y-axis frequencies.
- **magneticfield_z_dc_fft** [float]: The DC component of the FFT on the magneticfield z-axis.
- **magneticfield_z_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the magneticfield z-axis.
- **magneticfield_z_first_val_fft** [float]: The energy of the strongest FFT component on the magneticfield z-axis.
- **magneticfield_z_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the magneticfield z-axis.
- **magneticfield_z_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the magneticfield z-axis.
- **magneticfield_z_mean** [float]: The average acceleration across the sampled magneticfield z-axis values.
- **magneticfield_z_mean_fft** [float]: The average energy across the FFT components on the magneticfield z-axis.
- **magneticfield_z_median** [float]: The median acceleration across the sampled magneticfield z-axis values.
- **magneticfield_z_median_fft** [float]: The median FFT value (energy) across the z-axis frequencies.
- **magneticfield_z_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the magneticfield z-axis.
- **magneticfield_z_second_val_fft** [float]: The energy of the second strongest FFT component on the magneticfield z-axis.
- **magneticfield_z_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the magneticfield z-axis.

- **magneticfield_z_third_val_fft** [float]: The energy of the third strongest FFT component on the magneticfield z-axis.
- **magneticfield_z_var** [float]: The variance of the acceleration across the sampled magneticfield z-axis values.
- **magneticfield_z_var_fft** [float]: The variance of the FFT values obtained from magneticfield z-axis frequencies.
- **magneticfield_cov_y_x** [float]: The y-x covariance of the sampled magneticfield values.
- **magneticfield_cov_z_x** [float]: The z-x covariance of the sampled magneticfield values.
- **magneticfield_cov_z_y** [float]: The z-y covariance of the sampled magneticfield values.
- **pressure_dc_fft** [float]: The DC component of the FFT on the barometer.
- **pressure_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the barometer.
- **pressure_first_val_fft** [float]: The energy of the strongest FFT component on the barometer.
- **pressure_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the barometer.
- **pressure_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the barometer.
- **pressure_mean** [float]: The average acceleration across the sampled barometer values.
- **pressure_mean_fft** [float]: The average energy across the FFT components on the barometer.
- **pressure_median** [float]: The median acceleration across the sampled barometer values.
- **pressure_median_fft** [float]: The median FFT value (energy) across the x-axis frequencies.
- **pressure_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the barometer.
- **pressure_second_val_fft** [float]: The energy of the second strongest FFT component on the barometer.
- **pressure_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the barometer.
- **pressure_third_val_fft** [float]: The energy of the third strongest FFT component on the barometer.
- **pressure_var** [float]: The variance of the acceleration across the sampled barometer values.
- **pressure_var_fft** [float]: The variance of the FFT values obtained from barometer frequencies.
- **orientationprobe_azimuth_mean** [float]: The mean azimuth of the device orientation.
- **orientationprobe_azimuth_median** [float]: The median azimuth of the device orientation.
- **orientationprobe_azimuth_middle_sample** [float]: The middle sample (in X) of azimuth of the device orientation.
- **orientationprobe_pitch_mean** [float]: The mean pitch of the device orientation.
- **orientationprobe_pitch_median** [float]: The median pitch of the device orientation.
- **orientationprobe_pitch_middle_sample** [float]: The middle sample (in X) of pitch of the device orientation.
- **orientationprobe_roll_mean** [float]: The mean roll of the device orientation.
- **orientationprobe_roll_median** [float]: The median roll of the device orientation.
- **orientationprobe_roll_middle_sample** [float]: The middle sample (in X) of roll of the device orientation.
- **rotationvector_cothetaover2_mean** [float]: Mean scalar component of the rotation vector component ($\cos(\theta/2)$) –may not be available.
- **rotationvector_cothetaover2_median** [float]: Median scalar component of the rotation vector component ($\cos(\theta/2)$) –may not be available.
- **rotationvector_cothetaover2_middle_sample** [float]: Middle sample (in X) of the rotation vector component ($\cos(\theta/2)$) –may not be available.
- **rotationvector_xsinthetaover2_mean** [float]: Mean rotation vector component along the x-axis ($x * \sin(\theta/2)$).
- **rotationvector_xsinthetaover2_median** [float]: Median rotation vector component along the x-axis ($x * \sin(\theta/2)$).
- **rotationvector_xsinthetaover2_middle_sample** [float]: Middle sample (in X) of rotation vector component along the x-axis ($x * \sin(\theta/2)$).
- **rotationvector_ysinthetaover2_mean** [float]: Mean rotation vector component along the y-axis ($y * \sin(\theta/2)$).
- **rotationvector_ysinthetaover2_median** [float]: Median rotation vector component along the y-axis ($y * \sin(\theta/2)$).

- **rotationvector_ysinthetaover2_middle_sample** [float]: Middle sample (in X) of rotation vector component along the y-axis ($y * \sin(\theta/2)$).
- **rotationvector_zsinthetaover2_mean** [float]: Mean rotation vector component along the z-axis ($z * \sin(\theta/2)$).
- **rotationvector_zsinthetaover2_median** [float]: Median rotation vector component along the z-axis ($z * \sin(\theta/2)$).
- **rotationvector_zsinthetaover2_middle_sample** [float]: Middle sample (in X) of rotation vector component along the z-axis ($z * \sin(\theta/2)$).
- **linearacceleration_cov_y_x** [float]: The y-x covariance of the sampled linear-accelerometer values.
- **linearacceleration_cov_z_x** [float]: The z-x covariance of the sampled linear-accelerometer values.
- **linearacceleration_cov_z_y** [float]: The z-y covariance of the sampled linear-accelerometer values.
- **linearacceleration_x_dc_fft** [float]: The DC component of the FFT on the linear-accelerometer x-axis.
- **linearacceleration_x_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the linear-accelerometer x-axis.
- **linearacceleration_x_first_val_fft** [float]: The energy of the strongest FFT component on the linear-accelerometer x-axis.
- **linearacceleration_x_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the linear-accelerometer x-axis.
- **linearacceleration_x_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the linear-accelerometer x-axis.
- **linearacceleration_x_mean** [float]: The average acceleration across the sampled linear-accelerometer x-axis values.
- **linearacceleration_x_mean_fft** [float]: The average energy across the FFT components on the linear-accelerometer x-axis.
- **linearacceleration_x_median** [float]: The median acceleration across the sampled linear-accelerometer x-axis values.
- **linearacceleration_x_median_fft** [float]: The median FFT value (energy) across the x-axis frequencies.
- **linearacceleration_x_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the linear-accelerometer x-axis.
- **linearacceleration_x_second_val_fft** [float]: The energy of the second strongest FFT component on the linear-accelerometer x-axis.
- **linearacceleration_x_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the linear-accelerometer x-axis.
- **linearacceleration_x_third_val_fft** [float]: The energy of the third strongest FFT component on the linear-accelerometer x-axis.
- **linearacceleration_x_var** [float]: The variance of the acceleration across the sampled linear-accelerometer x-axis values.
- **linearacceleration_x_var_fft** [float]: The variance of the FFT values obtained from linear-accelerometer x-axis frequencies.
- **linearacceleration_y_dc_fft** [float]: The DC component of the FFT on the linear-accelerometer y-axis.
- **linearacceleration_y_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the linear-accelerometer y-axis.
- **linearacceleration_y_first_val_fft** [float]: The energy of the strongest FFT component on the linear-accelerometer y-axis.
- **linearacceleration_y_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the linear-accelerometer y-axis.
- **linearacceleration_y_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the linear-accelerometer y-axis.

- **linearacceleration_y_mean** [float]: The average acceleration across the sampled linear-accelerometer y-axis values.
- **linearacceleration_y_mean_fft** [float]: The average energy across the FFT components on the linear-accelerometer y-axis.
- **linearacceleration_y_median** [float]: The median acceleration across the sampled linear-accelerometer y-axis values.
- **linearacceleration_y_median_fft** [float]: The median FFT value (energy) across the y-axis frequencies.
- **linearacceleration_y_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the linear-accelerometer y-axis.
- **linearacceleration_y_second_val_fft** [float]: The energy of the second strongest FFT component on the linear-accelerometer y-axis.
- **linearacceleration_y_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the linear-accelerometer y-axis.
- **linearacceleration_y_third_val_fft** [float]: The energy of the third strongest FFT component on the linear-accelerometer y-axis.
- **linearacceleration_y_var** [float]: The variance of the acceleration across the sampled linear-accelerometer y-axis values.
- **linearacceleration_y_var_fft** [float]: The variance of the FFT values obtained from linear-accelerometer y-axis frequencies.
- **linearacceleration_z_dc_fft** [float]: The DC component of the FFT on the linear-accelerometer z-axis.
- **linearacceleration_z_first_idx_fft** [int]: The index to the component (frequency) of the FFT with the most energy on the linear-accelerometer z-axis.
- **linearacceleration_z_first_val_fft** [float]: The energy of the strongest FFT component on the linear-accelerometer z-axis.
- **linearacceleration_z_fourth_idx_fft** [int]: The index (frequency) of the FFT with the fourth most energy on the linear-accelerometer z-axis.
- **linearacceleration_z_fourth_val_fft** [float]: The energy of the fourth strongest FFT component on the linear-accelerometer z-axis.
- **linearacceleration_z_mean** [float]: The average acceleration across the sampled linear-accelerometer z-axis values.
- **linearacceleration_z_mean_fft** [float]: The average energy across the FFT components on the linear-accelerometer z-axis.
- **linearacceleration_z_median** [float]: The median acceleration across the sampled linear-accelerometer z-axis values.
- **linearacceleration_z_median_fft** [float]: The median FFT value (energy) across the z-axis frequencies.
- **linearacceleration_z_second_idx_fft** [int]: The index (frequency) of the FFT with the second most energy on the linear-accelerometer z-axis.
- **linearacceleration_z_second_val_fft** [float]: The energy of the second strongest FFT component on the linear-accelerometer z-axis.
- **linearacceleration_z_third_idx_fft** [int]: The index (frequency) of the FFT with the third most energy on the linear-accelerometer z-axis.
- **linearacceleration_z_third_val_fft** [float]: The energy of the third strongest FFT component on the linear-accelerometer z-axis.
- **linearacceleration_z_var** [float]: The variance of the acceleration across the sampled linear-accelerometer z-axis values.
- **linearacceleration_z_var_fft** [float]: The variance of the FFT values obtained from linear-accelerometer z-axis frequencies.
- **gyroscopestat_x_middle_sample** [float]: The middle sample (in X) of the gyroscope in the x-axis.

- **gyroscopestat_y_middle_sample** [float]: The middle sample (in X) of the gyroscope in the y-axis.
- **gyroscopestat_z_middle_sample** [float]: The middle sample (in X) of the gyroscope in the z-axis.
- **magneticfield_x_middle_sample** [float]: The middle sample (in X) of the magnetometer in the x-axis.
- **magneticfield_y_middle_sample** [float]: The middle sample (in X) of the magnetometer in the y-axis.
- **magneticfield_z_middle_sample** [float]: The middle sample (in X) of the magnetometer in the z-axis.
- **pressure_middle_sample** [float]: The middle sample (in X) of the barometer.

T3: Probe activated once every 10 seconds (0.1 Hz), and records for 10 seconds, then processes the recording into a single record with the fields below. Audio is recorded at 8KHz, FFT size is 2^{13} , 12 MFC coefficient, Mel Bands 20, Frequency Band Edges {50, 250, 500, 1000, 2000} Mhz.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **audio_diffsecs** [float]: The seconds which have passed since the last recording finished.
- **audio_l1norm** [float]: The L1 normalization of the recorded audio samples (sum of values divided by the number of values)
- **audio_l2norm** [float]: The L2 normalization of the recorded audio samples (sum of the squares of the values divided by the number of values)
- **audio_linfnorm** [float]: The square root of the L2 normalization.
- **audpsd_acrossfreqbands0** [float]: The Power Spectral Density across the 50MHz band.
- **audpsd_acrossfreqbands1** [float]: The Power Spectral Density across the 250MHz band.
- **audpsd_acrossfreqbands2** [float]: The Power Spectral Density across the 500MHz band.
- **audpsd_acrossfreqbands3** [float]: The Power Spectral Density across the 1000MHz band.
- **audio_mfccs0** [float]: Mel-frequency cepstral coefficient #1.
- **audio_mfccs1** [float]: Mel-frequency cepstral coefficient #2
- **audio_mfccs2** [float]: Mel-frequency cepstral coefficient #3
- **audio_mfccs3** [float]: Mel-frequency cepstral coefficient #4
- **audio_mfccs4** [float]: Mel-frequency cepstral coefficient #5
- **audio_mfccs5** [float]: Mel-frequency cepstral coefficient #6
- **audio_mfccs6** [float]: Mel-frequency cepstral coefficient #6
- **audio_mfccs7** [float]: Mel-frequency cepstral coefficient #7
- **audio_mfccs8** [float]: Mel-frequency cepstral coefficient #8
- **audio_mfccs9** [float]: Mel-frequency cepstral coefficient #8
- **audio_mfccs10** [float]: Mel-frequency cepstral coefficient #9
- **audio_mfccs11** [float]: Mel-frequency cepstral coefficient #10
- **audio_timestamp** [string]: Datetime of when the recording was taken.
- **light_accuracy** [float]: Accuracy of the light sensor's recording.
- **light_lux** [float]: Ambient light in SI lux units.
- **light_timestamp** [string]: Datetime of when the recording was taken.

T4: Sampled once every 5 seconds (0.2 Hz). System statistics were acquired from the Linux /proc folder. Details on the memory features can be found [here](#) and process stats [here](#). Information on the interrupts were taken from the /proc/interrupts folder.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **version** [string]: The current version of the Sherlock collection agent running on the device.
- **traffic_mobilerxbytes** [int]: Number of Bytes received over mobile data since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).

- **traffic_mobilerxpackets** [int]: Number of Packets received over mobile data since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_mobiletxbytes** [int]: Number of Bytes transmitted over mobile data since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_mobiletxpackets** [int]: Number of Packets transmitted over mobile data since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalrxbytes** [int]: Number of Bytes received over all networks since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalrxpackets** [int]: Number of Packets received over all networks since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totaltxbytes** [int]: Number of Bytes transmitted over all networks since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totaltxpackets** [int]: Number of Packets transmitted over all networks since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalwifirxbytes** [int]: Number of Bytes received over Wi-Fi since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalwifirxpackets** [int]: Number of Packets received over all networks since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalwifitxbytes** [int]: Number of Bytes transmitted over Wi-Fi since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_totalwifitxpackets** [int]: Number of Packets transmitted over Wi-Fi since the last activation of the T4 probe (a value of -1 indicates that this is the first sample since boot).
- **traffic_timestamp** [string]: DateTime indicating when the traffic was calculated.
- **battery_charge_type** [int]: A [value](#) indicating the method of charging.
- **battery_current_avg** [int]: [Average battery current in microamperes](#), as an integer. Positive values indicate net current entering the battery from a charge source, negative values indicate net current discharging from the battery. The time period over which the average is computed may depend on the fuel gauge hardware and its configuration.
- **battery_health** [int]: A [value](#) that indicated the current health of the battery (e.g., good, hot, over voltage,...)
- **battery_icon_small** [int]: The resource ID of a small status bar icon indicating the current battery state
- **battery_invalid_charger** [int]: Indication if the charger is invalid.
- **battery_level** [int]: The current battery level (0-100)
- **battery_online** [bool]: An indication if the battery is operational.
- **battery_plugged** [bool]: An indication if the battery is plugged in.
- **battery_present** [string –bool]: An indication if the battery is in the device.
- **battery_scale** [int]: The maximum battery level.
- **battery_status** [int]: the [current status constant](#).
- **battery_technology** [string]: The technology of the current battery.
- **battery_temperature** [int]: The current battery temperature in tenths of a degree Centigrade.
- **battery_timestamp** [string]: A DateTime indicating when the battery statistics were sampled.
- **battery_voltage** [int]: current battery voltage in millivolts.
- **cpuhertz** [int]: the current clock speed of the CPU taken from `proc/sys/devices/system/cpu/cpu0/cpufreq/scaling_cur_freq`
- **cpu_0** [int]: CPU utilization of core #0 in percentage.
- **cpu_1** [int]: CPU utilization of core #1 in percentage.
- **cpu_2** [int]: CPU utilization of core #2 in percentage.
- **cpu_3** [int]: CPU utilization of core #3 in percentage.
- **total_cpu** [int]: Total CPU utilization in percentage.

- **totalmemory_freesize** [int]: Memory free in the Android heap.
- **totalmemory_max_size** [int]: Max memory available in the Android heap.
- **totalmemory_total_size** [int]: Total memory in the Android heap.
- **totalmemory_used_size** [int]: Total memory used in the Android heap.
- **memtotal** [int]: Total amount of usable RAM, in kibibytes, which is physical RAM minus a number of reserved bits and the kernel binary code.
- **Memfree** [int]: The amount of physical RAM, in kibibytes, left unused by the system.
- **buffers** [int]: The amount, in kibibytes, of temporary storage for raw disk blocks.
- **cached** [int]: The amount of physical RAM, in kibibytes, used as cache memory.
- **swpcached** [int]: The amount of memory, in kibibytes, that has once been moved into swap, then back into the main memory, but still also remains in the swapfile. This saves I/O, because the memory does not need to be moved into swap again.
- **active** [int]: The amount of memory, in kibibytes, that has been used more recently and is usually not reclaimed unless absolutely necessary.
- **inactive** [int]: The amount of memory, in kibibytes, that has been used less recently and is more eligible to be reclaimed for other purposes.
- **active_anon** [int]: The amount of anonymous and tmpfs/shmem memory, in kibibytes, that is in active use, or was in active use since the last time the system moved something to swap.
- **inactive_anon** [int]: The amount of anonymous and tmpfs/shmem memory, in kibibytes, that is a candidate for eviction.
- **active_file** [int]: The amount of file cache memory, in kibibytes, that is in active use, or was in active use since the last time the system reclaimed memory.
- **inactive_file** [int]: The amount of file cache memory, in kibibytes, that is newly loaded from the disk, or is a candidate for reclaiming.
- **unevictable** [int]: The amount of memory, in kibibytes, discovered by the pageout code, that is not evictable because it is locked into memory by user programs.
- **mlocked** [int]: The total amount of memory, in kibibytes, that is not evictable because it is locked into memory by user programs.
- **hightotal** [int]: The total amount of memory, in kilobytes, that is not directly mapped into kernel space.
- **highfree** [int]: The free memory, in kilobytes, that is not directly mapped into kernel space.
- **lowtotal** [int]: The total amount of memory, in kilobytes, that is directly mapped into kernel space.
- **lowfree** [int]: The free memory, in kilobytes, that is directly mapped into kernel space.
- **swaptotal** [int]: The total amount of swap available, in kibibytes.
- **swapfree** [int]: The total amount of swap free, in kibibytes.
- **dirty** [int]: The total amount of memory, in kibibytes, waiting to be written back to the disk.
- **writeback** [int]: The total amount of memory, in kibibytes, actively being written back to the disk.
- **anonpages** [int]: The total amount of memory, in kibibytes, used by pages that are not backed by files and are mapped into userspace page tables.
- **mapped** [int]: The memory, in kibibytes, used for files that have been mmaped, such as libraries.
- **shmem** [int]: The total amount of memory, in kibibytes, used by shared memory (shmem) and tmpfs.
- **slab** [int]: The total amount of memory, in kibibytes, used by the kernel to cache data structures for its own use.
- **sreclaimable** [int]: The part of Slab that can be reclaimed, such as caches.
- **sunreclaim** [int]: The part of Slab that cannot be reclaimed even when lacking memory.
- **kernelstack** [int]: The amount of memory, in kibibytes, used by the kernel stack allocations done for each task in the system.
- **pagetables** [int]: The total amount of memory, in kibibytes, dedicated to the lowest page table level.
- **commitlimit** [int]: The total amount of memory currently available to be allocated on the system based on the overcommit ratio.

- **committed_as** [int]: The total amount of memory, in kibibytes, estimated to complete the workload. This value represents the worst case scenario value, and also includes swap memory.
- **vmalloctotal** [int]: The total amount of memory, in kibibytes, of total allocated virtual address space.
- **vmallocused** [int]: The total amount of memory, in kibibytes, of used virtual address space.
- **vmallocchunk** [int]: The largest contiguous block of memory, in kibibytes, of available virtual address space.
- **msmgpio_cpu0** [int]: Accumulative interrupts for the msmgpio component. Interrupts on CPU #0.
- **msmgpio_sum_cpu123** [int]: Accumulative interrupts for the msmgpio component. Interrupts on CPUs #1, #2, #3.
- **wcd9xxx_cpu0** [int]: Accumulative interrupts for the wcd9xxx component. Interrupts on CPU #0.
- **wcd9xxx_sum_cpu123** [int]: Accumulative interrupts for the wcd9xxx component. Interrupts on CPUs #1, #2, #3.
- **pn547_cpu0** [int]: Accumulative interrupts for the pn547 component. Interrupts on CPU #0.
- **pn547_sum_cpu123** [int]: Accumulative interrupts for the pn547 component. Interrupts on CPUs #1, #2, #3.
- **cypress_touchkey_cpu0** [int]: Accumulative hardware interrupt count of back button presses. Interrupts on CPU #0.
- **cypress_touchkey_sum_cpu123** [int]: Accumulative hardware interrupt count of back button presses. Interrupts on CPUs #1, #2, #3.
- **synaptics_rmi4_i2c_cpu0** [int]: Accumulative hardware interrupt count for the **touch screen** (a single gesture may incur many interrupts –e.g., x y coordinate change). Interrupts on CPU #0.
- **synaptics_rmi4_i2c_sum_cpu123** [int]: Accumulative hardware interrupt count for the touch screen (a single gesture may incur many interrupts –e.g., x y coordinate change). Interrupts on CPUs #1, #2, #3.
- **sec_headset_detect_cpu0** [int]: Accumulative hardware interrupt count for head set detection. Interrupts on CPU #0.
- **sec_headset_detect_sum_cpu123** [int]: Accumulative hardware interrupt count for head set detection. Interrupts on CPUs #1, #2, #3.
- **flip_cover_cpu0** [int]: Accumulative hardware interrupt count for head set detection. Interrupts on CPU #0.
- **flip_cover_sum_cpu123** [int]: Accumulative hardware interrupt count for head set detection. Interrupts on CPUs #1, #2, #3.
- **home_key_cpu0** [int]: Accumulative hardware interrupt count of home key presses. Interrupts on CPU #0.
- **home_key_sum_cpu123** [int]: Accumulative hardware interrupt count of home key presses. Interrupts on CPUs #1, #2, #3.
- **volume_down_cpu0** [int]: Accumulative hardware interrupt count of volume down button presses. Interrupts on CPU #0.
- **volume_down_sum_cpu123** [int]: Accumulative hardware interrupt count of volume down button presses. Interrupts on CPUs #1, #2, #3.
- **volume_up_cpu0** [int]: Accumulative hardware interrupt count of volume up button presses. Interrupts on CPU #0.
- **volume_up_sum_cpu123** [int]: Accumulative hardware interrupt count of volume up button presses. Interrupts on CPUs #1, #2, #3.
- **companion_cpu0** [int]: Accumulative hardware interrupt count of companion occurrences. Interrupts on CPU #0.
- **companion_sum_cpu123** [int]: Accumulative hardware interrupt count of companion occurrences. Interrupts on CPUs #1, #2, #3.
- **slimbus_cpu0** [int]: Accumulative interrupt count on the slimbus. Interrupts on CPU #0.
- **slimbus_sum_cpu123** [int]: Accumulative interrupt count on the slimbus. Interrupts on CPUs #1, #2, #3.
- **function_call_interrupts_cpu0** [int]: Accumulative software interrupt count on function calls. Interrupts on CPU #0.
- **function_call_interrupts_sum_cpu123** [int]: Accumulative software interrupt count on function calls. Interrupts on CPUs #1, #2, #3.

- **cpu123_intr_prs** [int]: Accumulative interrupt count on the intr_prs element.
- **tot_user** [int]: The number of normal processes executing in user mode.
- **tot_nice** [int]: The number of niced processes executing in user mode.
- **tot_system** [int]: The number of processes executing in kernel mode.
- **tot_idle** [int]: The number of twiddling thumbs.
- **tot_iowait** [int]: The number of waiting for I/O to complete.
- **tot_irq** [int]: The number of servicing interrupts.
- **tot_softirq** [int]: The number of servicing softirqs.
- **ctxt** [int]: The total number of context switches across all CPUs.
- **btime** [int]: The time at which the system booted, in seconds since the Unix epoch.
- **processes** [int]: The number of processes and threads created, which includes (but is not limited to) those created by calls to the fork() and clone() system calls.
- **procs_running** [int]: The number of processes currently running on CPUs.
- **procs_blocked** [int]: The number of processes currently blocked, waiting for I/O to complete.
- **connectedwifi_ssaid** [int]: The salted hash of the connected Wi-Fi access point's SSID.
- **connectedwifi_level** [int]: The reception level of the connected Wi-Fi access point (RSSI).
- **internal_availableblocks** [int]: Available blocks in internal storage.
- **internal_blockcount** [int]: Number of blocks in internal storage.
- **internal_freeblocks** [int]: Free blocks in internal storage.
- **internal_blocksize** [int]: Block size in internal storage.
- **internal_availablebytes** [int]: Available Bytes in internal storage.
- **internal_freebytes** [int]: Free Bytes in internal storage.
- **internal_totalbytes** [int]: Total Bytes in external (SD card) storage.
- **external_availableblocks** [int]: Available blocks in external (SD card) storage.
- **external_blockcount** [int]: Number of blocks in external (SD card) storage.
- **external_freeblocks** [int]: Number of blocks in external (SD card) storage.
- **external_blocksize** [int]: Block size in external (SD card) storage.
- **external_availablebytes** [int]: Available Bytes in external (SD card) storage.
- **external_freebytes** [int]: Free Bytes in external (SD card) storage.
- **external_totalbytes** [int]: Total Bytes in external (SD card) storage.

Application: Probe activated with T4 (once every 5 seconds). For *each* running application, a record is made with the following data fields. For Linux level features, see [here](#) for reference material.

- **userid** [string]: the user ID to whom this sample belongs to.
- **uuid** [int]: Unix timestamp in milliseconds of when this event occurred.
- **applicationname** [string]: The name of the sampled application described in this record.
- **cpu_usage** [double]: The percent of CPU utilization normalized to a constant CPU clock speed. Note that this data field has been depreciated. It is recommended to use the stime, utime, cstime, cutime fields to measure the app's activity.
- **packagename** [string]: The Android package name of this app (e.g., com.example.helloandroid)
- **packageuid** [int]: The UID identifier of this app's package.
- **uidrxbytes** [int]: Bytes received by this application since the last time the T4 probe was activated (approximately 5 seconds on average –compare uuids for accuracy). If this is the first sample since boot, then the value is -1.
- **uidrxpackets** [int]: Packets received by this application since the last time the T4 probe was activated (approximately 5 seconds on average –compare uuids for accuracy). If this is the first sample since boot, then the value is -1.

- **uidtxbytes** [int]: Bytes transmitted by this application since the last time the T4 probe was activated (approximately 5 seconds on average –compare uuids for accuracy). If this is the first sample since boot, then the value is -1.
- **uidtxpackets** [int]: Packets transmitted by this application since the last time the T4 probe was activated (approximately 5 seconds on average –compare uuids for accuracy). If this is the first sample since boot, then the value is -1.
- **cguest_time** [int]: Guest time of the process's children, measured in clock ticks.
- **cmajflt** [int]: The number of major faults that the process's waited-for children have made.
- **cstime** [int]: Amount of time that this process's waited-for children have been scheduled in kernel mode, measured in clock ticks.
- **cutime** [int]: Amount of time that this process's waited-for children have been scheduled in user mode, measured in clock ticks. This includes guest time, cguest_time (time spent running a virtual CPU).
- **dalvikprivatedirty** [int]: The private dirty pages used by dalvik heap.
- **dalvikpss** [int]: The proportional set size for dalvik heap.
- **dalvikshareddirty** [int]: The shared dirty pages used by dalvik heap.
- **guest_time** [int]: Guest time of the process (time spent running a virtual CPU for a guest operating system), measured in clock ticks.
- **importance** [int]: The relative importance level that the system places on this process ([details](#)). For example, background, foreground, service, sleeping, ...etc.
- **importanceReasoncode** [int]: The reason for importance, if any ([details](#)).
- **importanceReasonpid** [int]: For the specified values of importanceReasonCode, this is the process ID of the other process that is a client of this process ([details](#)).
- **lru** [int]: An additional ordering within a particular Android importance category, providing finer-grained information about the relative utility of processes within a category ([details](#)).
- **nativeprivatedirty** [int]: The private dirty pages used by the native heap.
- **nativepss** [int]: The proportional set size for the native heap.
- **nativeshareddirty** [int]: The shared dirty pages used by the native heap.
- **num_threads** [int]: Number of threads in this process.
- **otherprivatedirty** [int]: The private dirty pages used by everything else.
- **otherpss** [int]: The proportional set size for everything else.
- **othershareddirty** [int]: The shared dirty pages used by everything else.
- **pgid** [int]: : The ID of the foreground process group of the process.
- **pid** [int]: The process ID of this process.
- **ppid** [int]: The PID of parent process.
- **priority** [int]: (Explanation for Linux 2.6) For processes running a real-time scheduling policy (policy below; see sched_setscheduler(2)), this is the negated scheduling priority, minus one; that is, a number in the range -2 to -100, corresponding to real-time priorities 1 to 99. For processes running under a non-real-time scheduling policy, this is the raw nice value (setpriority(2)) as represented in the kernel. The kernel stores nice values as numbers in the range 0 (high) to 39 (low), corresponding to the user-visible nice range of -20 to 19.
- **rss** [int]: Resident Set Size: number of pages the process has in real memory. This is just the pages which count toward text, data, or stack space. This does not include pages which have not been demand-loaded in, or which are swapped out.
- **rsslim** [int]: Current soft limit in bytes on the rss of the process.
- **sid** [int]: The process's session ID.
- **start_time** [int]: The time the process started after system boot. In kernels before Linux 2.6, this value was expressed in jiffies. Since Linux 2.6, the value is expressed in clock ticks.
- **state** [string]: Current state of the process. One of "R (running)", "S (sleeping)", "D (disk sleep)", "T (stopped)", "T (tracing stop)", "Z (zombie)", or "X (dead)".

- **stime** [int]: Amount of time that this process has been scheduled in kernel mode, measured in clock ticks.
- **tcomm** [string]: An associated string with the executable's name.
- **utime** [int]: Amount of time that this process has been scheduled in user mode, measured in clock ticks. This includes guest time, `guest_time` (time spent running a virtual CPU, see below), so that applications that are not aware of the guest time field do not lose that time from their calculations.
- **vsize** [int]: Virtual memory size in bytes.
- **version_code** [int]: An integer used as an internal version number for the Android app. This number is used only to determine whether one version is more recent than another, with higher numbers indicating more recent versions. This is not the version number shown to users ([details](#)).
- **version_name** [string]: A string used as the version number shown to users. This setting can be specified as a raw string or as a reference to a string resource.
- **sherlock_version** [string]: The current version of the Sherlock collection agent running on the device.
- **tgpid** [int]: The ID of the foreground process group of the controlling terminal of the process. -1 if the process is not connected to a terminal.
- **Flags** [string]: the internal kernel flags holding the status of the socket (e.g., 00010000).
- **Wchan** [string]: This is the "channel" in which the process is waiting. It is the address of a location in the kernel where the process is sleeping. The corresponding symbolic name can be found in `/proc/[pid]/wchan`.
- **exit_signal** [int]: Signal to be sent to parent when we die.
- **minflt** [int]: The number of minor faults the process has made which have not required loading a memory page from disk.
- **cminflt** [int]: The number of minor faults that the process's waited-for children have made.
- **majflt** [int]: The number of major faults the process has made which have required loading a memory page from disk.
- **startcode** [int]: The address above which program text can run.
- **endcode** [int]: The address below which program text can run.
- **nice** [int]: The nice value a value in the range 19 (low priority) to -20 (high priority).
- **ltrealvalue** [int]: The time in jiffies before the next SIGALRM is sent to the process due to an interval timer. Since kernel 2.6.17, this field is no longer maintained, and is hard coded as 0.
- **Processor** [int]: CPU number last executed on.
- **rt_priority** [int]: Real-time scheduling priority, a number in the range 1 to 99 for processes scheduled under a real-time policy, or 0, for non-real-time processes.