Zendrive Documentation

Release 0.0.21

Zendrive

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Contents

Analytics API Documentation

1.1 Introduction

The Zendrive Driver Analytics API provides driver analytics metrics at various aggregation levels via URI paths. To use this API, your application should make a HTTPS request and parse the response. The response format is JSON. Use standard HTTP GET methods to retrieve driver analytics. We support cross-origin resource sharing to allow you to interact securely with our API from a client-side web application. **Remember that you should never expose your secret API key in any public website's client-side code**. JSON will be returned in all responses from the API, including errors.

Since the API is based on open standards, you can use any web development language to access the API.

1.2 Authentication

You authenticate to the Zendrive API endpoint by providing your application key in the request parameters. The application key must be specified as the apikey query parameter. It is a required parameter in every API request. *Sign Up<http://zendrive.com>* to get your API key. Your API key carries many privileges, so keep it secret and secure!

All API requests must be made over HTTPS. Calls made over plain HTTP will fail.

1.3 API Host and Versioning

All API requests must be sent to https://api.zendrive.com. All API requests must contain the appropriate version in the path. Current API version is v3.

1.4 Errors

Zendrive API uses conventional HTTP response codes to indicate success or failure of an API request. Response codes in the 2xx range indicate success, codes in the 4xx range indicate an error that resulted from the provided information (e.g. a required parameter was missing etc.) and codes in the 5xx range indicate an error with Zendrive's servers. The error response JSON may have following attributes.

error	A human readable message giving more details about the error.

1.5 List Endpoints

Several Zendrive API end points return a list of resources like drivers or trips. Such lists of resources can be large depending on your fleet size (number of drivers or number of trips) and time window of the query. The API provides some common parameters to process responses from these List endpoints. All of them are optional.

1.5.1 Pagination

The list API methods share a common structure for pagination. Zendrive uses cursor-based pagination, using the parameters `offset` and `limit`.

Query Parameter	Default	Description
offset	0	A cursor for use in pagination. `offset` is the index of object that defines your place in the list. For instance, if you make a list request and receive first 20 objects, your subsequent call should include `offset=20` in order to fetch the next page of the result list. The list API responses also contain `next_offset` parameter which can be used to fetch next page. When there are no more elements left in the list `next_offset` is missing from the response.
limit	10	A limit on the number of objects to be returned. Limit can range between 1 and 50.

1.5.2 Sorting

The list API methods also allow sorting the list by different numerical attributes in both ascending and descending order. This can be done by the `order_by` and `order_type` query parameters.

Query Parameter	Default	Description
order_by	none	Specifies the numerical attribute by which to sort the list of resources in the response. This is supported for the zendrive score and the various event_rating types in the **driving_behavior** section of the response (e.g: **zendrive_score**, **overspeeding_rating**, **phone_use_rating**) and numerical attributes in the **info** section of the response (e.g: **distance_km**, **duration_seconds**). **start_time** is also a valid field. By default, lists in responses are unsorted.
order_type	asc	Specifies the sort order. **asc** for sorting in ascending order. **desc** for sorting in descending order.

1.6 Date Range

All endpoints allow lookup of data in a specific date range. The date range can be specified using the `start_date` and `end_date` query parameters. Specifying a date range is optional. If a date range is not specified. API endpoints return data for the last one week.

Query Parameter	Description
start_date	Lookup data from active drivers between start_date and end_date [both inclusive]. Date format is YYYY-MM-DD. Time zone is in UTC.
end_date	Lookup data from active drivers between start_date and end_date [both inclusive]. Date format is YYYY-MM-DD. Time zone is in UTC.

1.7 Zendrive Scores

The safety and efficiency of your fleet drivers can make or break your bottom line. Zendrive SDK was built to give fleet managers insight into the quality and safety of their drivers based on detailed driving behavior. By accessing phone sensors and combining that data with context about the drive time and place, Zendrive can identify both safe and risky driving - allowing fleet managers to take action before poor driving becomes a liability. Zendrive mobile SDK automatically detects the start and end of driving (called trips) and collects sensor data (GPS / accelerometer / gyroscope etc) throughout the trip.

Zendrive employs state of the art data analysis and machine learning algorithms to compute various driver behavior scores. The overall Zendrive Score is expressed as a number between 0 to 100, with a higher value corresponding to better driving practices. Drivers are also rated on individual driving events such as harsh braking, aggressive acceleration, speeding, hard turns and phone use. Individual event ratings are on a scale from 1-5, with 5 being the best. In a customer-facing application, this can be expressed as a simple number, or as a letter grade A-F (like on the Zendrive Dashboard), or in some other intuitive fashion like a star rating.

A value of -1 for an event rating indicates that the driver or the trip cannot be rated on that particular event. This happens most often for the Phone Use rating for drivers with phones that do not have gyroscope sensors, which are necessary to detect phone use events. In these cases, the Zendrive Dashboard displays "NA" instead of a letter grade for phone use score, and the overall Zendrive score is calculated from the remaining events, without consideration of phone use.

1.8 API Endpoints

1.8.1 List Driver Groups in a Fleet

```
curl https://api.zendrive.com/v3/groups?apikey={ZENDRIVE_ANALYTICS_API_KEY}
```

Note: This call takes no query parameters other than `apikey`.

Response field	Description
group_ids	A collection of all group ids that belong to the fleet. A group id is specified in Zendrive SDK initialization to tag a driver as part of a group.

Sample Response

```
{
    "group_ids" : [
        "san francisco",
        "new york",
        "chigaco"
    ]
}
```

1.8.2 List Drivers in a Fleet

Lookup active drivers in the given date range. An active driver is one who has at least one recorded trip in the given date range. This endpoint also allows look up of specific drivers using the ids parameter.

```
curl https://api.zendrive.com/v3/drivers?apikey={ZENDRIVE_ANALYTICS_API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
start_date	Lookup active drivers in this date range. See *Date Range* for description
end_date	Lookup active drivers in this date range. See *Date Range* for description
fields	Comma separated list of fields to lookup. If nothing is specified, all data is returned. • info : Returns information about driver [Total kilometers driven,Drive time etc] • driving_behavior: Returns driver score and event ratings calculated over the interval specified. • daily_driving_behavior: Returns driver score and event ratings calculated for each day during the interval specified.
limit	See *Pagination* section for description.
offset	See *Pagination* section for description.
ids	Comma separated list of driver ids for which data should be returned. Even if these drivers are not active between start_date and end_date the response will contain info and driving_behavior sections for these drivers.
group_id	If specified the list of drivers returned will be restricted to drivers that belong to the specified group. If a list of driver ids is explicitly given as query parameter then group_id parameter has no impact on result set.
order_by	Sort list by score_type or info fields. See *Sorting* section for details.
order_type	Sort order. See *Sorting* section for details.

Response field	Description
start_date	Start date of the request.
end_date	End date of the request.
next_offset	This is the value that should be passed in offset parameter to get the next page of response. If not present in response, it implies that this is the last page.
drivers	Array of drivers.
drivers[i].driver_id	Id of the driver. This is the ID specified when initializing the Zendrive SDK in the mobile application.
drivers[i].info	Various metrics of the driver.
drivers[i].info.num_trips	Number of trips.
drivers[i].info.distance_km	Distance travelled in kilometers.
drivers[i].info.duration_seconds	Total drive time of the driver across all trips in seconds
drivers[i].info.driver_start_date	The first time we saw data from this driver.
drivers[i].info.attributes	Additional attributes of the driver if it was provided during setup of the Zendrive SDK. The attributes are returned here as a json string. This is **NA** if no attributed were provided.
drivers[i].driving_behavior	Returns driver score and event ratings calculated over the interval specified.
drivers[i].driving_behavior.score.zendrive_score	Zendrive score of this driver at the end of the given date range.
drivers[i].driving_behavior.event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
drivers[i].driving_behavior.event_rating.hard_brake_rating	The hard brake rating of this driver at the end of the given date range.
drivers[i].driving_behavior.event_rating.phone_use_rating	The phone use rating of this driver at the end of the given date range.
drivers[i].driving_behavior.event_rating.rapid_acceleration_rating	The rapid acceleration rating of this driver at the end of the given date range.
drivers[i].driving_behavior.event_rating.hard_turn_rating	The hard turn rating of this driver at the end of the given date range.
drivers[i].driving_behavior.event_rating.over_speeding_rating	The over speeding rating of this driver at the end of the given date range.

Sample Response

```json
{
    "drivers": [{
        "info": {
            "trip_count": 10,
            "device_info": [{
                "missing_data": ["gyroscope"],
                "model": "samsung-SM-T567V",
                "version": "25"
            }],
            "distance_km": 9.041,
            "duration_seconds": 4519.34,
            "attributes": {
                "phone": "+19999999999",
                "first_name": "John",
                "last_name": "User",
                "email": "user@example.com"
            },
            "driver_start_date": "2018-01-18"
        },
        "driving_behavior": {
            "score": {
                "zendrive_score": 100
            },
            "event_rating": {
                "hard_brake_rating": 5,
```

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```
                "phone_use_rating": 5,
                "rapid_acceleration_rating": 5,
                "hard_turn_rating": 5,
                "overspeeding_rating": 5
            }
        },
        "driver_id": "adyuv4hd83"
    }],
    "next_offset": 50,
    "start_date": "2018-01-18",
    "end_date": "2018-01-25"
}
```

1.8.3 Fleet Scores

```
curl https://api.zendrive.com/v3/score?apikey={ZENDRIVE_ANALYTICS_API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
start_date	Lookup fleet score in this date range. See *Date Range* for description
end_date	Lookup fleet score in this date range. See *Date Range* for description
fields	Comma separated list of fields to lookup. If nothing is specified, info, daily_driving_behavior and driving_behavior are returned. • info : Returns information about the fleet [Total kilometers driven, Drive time etc]. • driving_behavior: Returns driver score and event ratings calculated over the interval specified. • daily_driving_behavior: Returns driver score and event ratings calculated for each day during the interval specified.
group_id	The fleet score is computed based on data from the specified group_id within the fleet.

Response field	Description
start_date	Start date of the request.
end_date	End date of the request.
info.distance_km	Total distance in km logged by all drivers in the fleet or group.
info.duration_seconds	Total drive time over all drivers in fleet or group represented in seconds
info.driver_count	Number of drivers in fleet or group active during the given date range.
info.last_trip_date	Date since the last recorded trip.
info.missing_data_driver_count	Number of drivers missing one or more data types (usually missing Gyroscope).
driving_behavior	Returns driver score and event ratings calculated over the interval specified.
driving_behavior.score.zendrive_score	Average Zendrive score across all drivers in the fleet in the given date range.
driving_behavior.event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
driving_behavior.event_rating.hard_brake_rating	Average hard braking rating across all drivers in the fleet in the given date range.
driving_behavior.event_rating.phone_use_rating	Average phone use rating across all drivers in the fleet in the given date range
driving_behavior.event_rating.rapid_acceleration_rating	Average rapid acceleration rating across all drivers in the fleet in the given date range.
driving_behavior.event_rating.hard_turn_rating	Average hard turning rating across all drivers in the fleet in the given date range.
driving_behavior.event_rating.overspeeding_rating	Average overspeeding rating across all drivers in the fleet in the given date range.
daily_driving_behavior[i]	Scores and Event Ratings for each day in the date range requested.
daily_driving_behavior[i].date	Date for which scores are provided in this tuple. Date format is YYYY-MM-DD.
daily_driving_behavior[i].score	A collection of various scores for the driver during the interval specified. Note that each score here is an average of daily scores for the driver over the given interval.
daily_driving_behavior[i].score.zendrive_score	Average Zendrive score across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
daily_driving_behavior[i].event_rating.hard_brake_rating	Average hard braking rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.phone_use_rating	Average phone use rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.rapid_acceleration_rating	Average rapid acceleration rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.hard_turn_rating	Average hard turn rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.overspeeding_rating	Average overspeeding rating across all drivers in the fleet on this particular date.

Sample Response

```
{
    "info": {
        "duration_seconds": 8400.32,
        "driver_count": 0,
        "distance_km": 0.0,
        "missing_data_driver_count": 0,
        "last_trip_date": "2018-11-03"
    },
    "driving_behavior": {
        "score": {
            "zendrive_score": 80
        },
        "event_rating": {
            "hard_brake_rating": 3,
            "phone_use_rating": 3,
            "rapid_acceleration_rating": 5,
            "hard_turn_rating": 5,
            "overspeeding_rating": 4
        }
    },
```

```
    "daily_driving_behavior": [{
        "date": "2017-09-12",
        "score": {
            "zendrive_score": 75
        },
        "event_rating": {
            "hard_brake_rating": 3,
            "phone_use_rating": 3,
            "rapid_acceleration_rating": 3,
            "hard_turn_rating": 3,
            "overspeeding_rating": 3
        }
    },
     { ... }
    ],
    "end_date": "2017-12-11",
    "start_date": "2017-09-12"
}
```

1.8.4 Driver Scores

```
curl https://api.zendrive.com/v3/driver/{driver_id}/score?apikey={ZENDRIVE_ANALYTICS_
↪API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
start_date	Lookup driver score in this date range. See *Date Range* for description
end_date	Lookup driver score in this date range. See *Date Range* for description
fields	Comma separated list of fields to lookup. If nothing is specified, info daily_driving_behavior and driving_behavior are returned. - info : Returns information about driver [Total kilometers driven, Drive time etc] - driving_behavior: Returns driver score and event ratings calculated over the interval specified. - daily_driving_behavior: Returns driver score and event ratings calculated for each day during the interval specified.

Response field	Description
start_date	Starting date for driver score returned in response. Same as request parameter if specified, else the start date considered by the API by default.
end_date	End date for driver score returned in response. Same as request parameter if specified, else the start date considered by the API by default.
info.distance_km	Total distance in km logged by the driver during the specified date range.
info.trip_count	Total number of trips logged by the driver during the specified date range.
info.driver_start_date	The date at which data was first logged by this driver.
info.attributes	Additional attributes of the driver if it was provided during setup of the Zendrive SDK. The attributes are provided as a json string. This is **NA** if no attributed were provided.
info.duration_seconds	Total drive time of the driver during the specified date range represented in seconds
info.highway_ratio	Indicates the fraction of trips recorded on highways (value lies within 0 & 1)
info.night_driving_fraction	Indicates the fraction of night (12:00 AM to 4:00 AM local time) driving (value lies within 0 & 1)
info.device_info	Devices that the driver has used (model name and version number). The missing_data key lists the essential sensors that is missing (like Gyroscope) in the device.
driving_behavior	Returns driver score and event ratings calculated over the interval specified.
driving_behavior.score.zendrive_score	Zendrive score of the driver at the end of the given data range.
driving_behavior.event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
driving_behavior.event_rating.hard_braking	Average hard braking rating of the driver at the end of the given date range.
driving_behavior.event_rating.phone_use	Average phone use rating of the driver at the end of the given date range.
driving_behavior.event_rating.hard_turn	Average hard turn rating of the driver at the end of the given date range.
driving_behavior.event_rating.overspeeding	Average overspeeding rating of the driver at the end of the given date range.
daily_driving_behavior[i]	Scores for each day in the date range requested.
daily_driving_behavior[i].date	Date for which scores are provided in this tuple. Date format is YYYY-MM-DD.
daily_driving_behavior[i].score	A collection of various scores for the driver during the interval specified. Note that each score here is an average of daily scores for the driver over the given interval.
daily_driving_behavior[i].score.zendrive_score	Average zendrive score of this driver at the end of the given date range.
daily_driving_behavior[i].event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
daily_driving_behavior[i].event_rating.hard_brake_rating	Average hard brake rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.phone_use_rating	Average phone use rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.rapid_acceleration_rating	Average rapid acceleration rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.hard_turn_rating	Average hard turn rating across all drivers in the fleet on this particular date.
daily_driving_behavior[i].event_rating.overspeeding_rating	Average overspeeding rating across all drivers in the fleet on this particular date.

Sample Response

```
{
    "info": {
        "trip_count": 4,
        "night_driving_fraction": 0.0,
        "device_info": [],
        "distance_km": 35.389,
        "duration_seconds": 9468.40,
        "attributes": {
            "first_name": "John",
            "last_name": " User",
            "email": "user@example.com"
        },
```

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```
        "driver_start_date": "2017-04-25"
    },
    "driving_behavior": {
        "score": {
            "zendrive_score": 79
        },
        "event_rating": {
            "hard_brake_rating": 5,
            "phone_use_rating": 4,
            "rapid_acceleration_rating": 3,
            "hard_turn_rating": 3,
            "overspeeding_rating": 4
        }
    },
    "daily_driving_behavior": [{
        "date": "2017-09-12",
        "score": {
            "zendrive_score": 75
        },
        "event_rating": {
            "hard_brake_rating": 3,
            "phone_use_rating": 3,
            "rapid_acceleration_rating": 3,
            "hard_turn_rating": 3,
            "overspeeding_rating": 3
        }
    }],
    "end_date": "2017-09-06",
    "start_date": "2017-09-01"
}
```

1.8.5 List Driver Sessions

```
curl https://api.zendrive.com/v3/driver/{driver_id}/sessions?apikey={ZENDRIVE_
↪ANALYTICS_API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
start_date	Lookup driver sessions in this date range. See *Date Range* for description.
end_date	Lookup driver sessions in this date range. See *Date Range* for description.
limit	See *Pagination* section for description.
offset	See *Pagination* section for description.

Response Field	Description
start_date	Start date of the request.
end_date	End date of the request.
sessions	List of session ids.
sessions[i].session_id	The session id provided by the application in the Zendrive SDK.

Sample Response

```
{
    "next_offset": 10,
    "start_date": "2014-11-16",
    "end_date": "2014-11-22",
    "sessions": [
        {
            "session_id": "542ebb4ee98f7c2438f6c140bb"
        },
        {
            "session_id": "542ebb4ee98f7c2438f6c140bb"
        },
        { ... }
    ]
}
```

1.8.6 List Driver Trips

```
curl https://api.zendrive.com/v3/driver/{driver_id}/trips?apikey={ZENDRIVE_ANALYTICS_
↪API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
start_date	Lookup trips from a driver in this date range. See *Date Range* for description.
end_date	Lookup trips from a driver in this date range. See *Date Range* for description.
fields	Comma separated list of fields to lookup. If nothing is specified, all data is returned. `info` : Returns information about driver [Total kilometers driven, Drive time etc]. `driving_behavior`: Returns driver score and event ratings.
session_ids	A comma separated list of session ids to filter trips by. Only trips tagged by the given session ids are returned. Sessions are specified in the Zendrive SDK. The mobile application can provide session ids to the SDK to tag trips with.
tracking_ids	A comma separated list of tracking ids to filter trips by. Only trips tagged by the given tracking ids are returned. Tracking ids are specified by the mobile application when recording a trip in manual mode.
limit	See *Pagination* section for description.
offset	See *Pagination* section for description.
order_by	Sort list by score_type or info fields. See *Sorting* section for details.
order_type	Sort order. See *Sorting* section for details.

Response Field	Description
start_date	Start date of the request.
end_date	End date of the request.
trips	List of trips from the driver in the given date range.
trips[i].trip_id	Unique Id of the trip assigned by Zendrive.
trips[i].info.distance_km	Length of the trip in km.
trips[i].info.duration_seconds	Total duration of the trip in seconds.
trips[i].info.trip_max_speed_kmph	Maximum speed reached during the duration of this trip
trips[i].info.start_time	Start time of trip in ISO format.
trips[i].info.end_time	End time of trip in ISO format.
trips[i].info.tracking_id	Tracking id of the trip if specified in the Zendrive SDK. This is available only for trips recorded in manual mode of the SDK.
trips[i].info.session_id	Id of the session this trip belongs to. This is available if the session was live in the Zendrive SDK when the trip was recorded.
driving_behavior.score.zendrive_score	Zendrive score of the trip.
driving_behavior.event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
driving_behavior.event_rating.hard_brake_rating	Hard brake rating of the trip.
driving_behavior.event_rating.phone_use_rating	Phone use rating
driving_behavior.event_rating.rapid_acceleration_rating	Rapid acceleration rating of the trip.
driving_behavior.event_rating.hard_turn_rating	Hard turn rating of the trip.
driving_behavior.event_rating.overspeeding_rating	Overspeeding rating of the trip.

Sample Response

```
{
    "trips": [{
        "info": {
            "insurance_period": "NA",
            "trip_max_speed_kmph": 96.40792534541973,
            "distance_km": 25.78,
            "end_time": "2017-09-29T13:55:16-04:00",
            "tracking_id": "39",
            "duration_seconds": 400.39,
            "start_time": "2017-09-29T13:16:11-04:00",
            "session_id": "1613190012"
        },
        "driving_behavior": {
            "score": {
                "zendrive_score": 84
            },
            "event_rating": {
                "hard_brake_rating": 3,
                "phone_use_rating": 4,
                "rapid_acceleration_rating": 4,
                "hard_turn_rating": 4,
                "overspeeding_rating": 3
            }
        },
        "trip_id": "1506705371408"
    }],
    "end_date": "2017-09-30",
    "start_date": "2017-09-01"
```

```
}
```

1.8.7 Trip Scores

```
curl https://api.zendrive.com/v3/driver/{driver_id}/trip/{trip_id}?apikey={ZENDRIVE_
↪ANALYTICS_API_KEY}
```

Note: All query parameters except `apikey` are optional.

Request Parameter	Description
fields	Comma separated list of fields to lookup. If nothing is specified, this defaults to 'info,driving_behavior'. • info : Returns recorded information about the trip [Total kilometers driven, Drive time etc]. • simple_path: Returns a coarse GPS trail of the trip. Useful for visualization of the trip path. • driving_behavior: Returns driver score and event ratings calculated over the interval specified. • speed_profile: Returns the speed profile of the trip as a tuple (Driver's speed in MPH, Timestamp in ms, Speed limit on the road segment). • events: Returns events detected by Zendrive during the trip. Events like OverSpeeding, PhoneUse, AggressiveAcceleration, HardBrake, HardTurn and Collision are returned. *PhoneScreenInteraction is currently in beta.*

Response Field	Description
trip_max_speed	Maximum speed reached during the duration of this trip
trip_id	Unique Id assigned by Zendrive for the trip where the event occurred.
info.distance_km	Distance in km of the trip.
info.duration_seconds	Total duration of the trip represented in seconds
info.start_time	Start time of trip in ISO format.
info.end_time	End time of trip in ISO format
info.session_id	Session id attached the trip if specified in the Zendrive SDK when the trip was recorded.
info.insurance_period	This is valid only for trips recorded by Fairmatic customers using the SDK. This is the Fairmatic insurance period associated with this trip. This will be 'NA' if Fairmatic insurance does not apply to the customer or the trip.
simple_path	An array of latitude, longitude, timestamp tuples representing a simplified path of the trip. The timestamp is in ISO format.
driving_behavior	Returns driver score and event ratings calculated over the interval specified."
driving_behavior.score.zendrive	Zendrive score of the trip.
driving_behavior.event_rating	A collection of various events for the driver during the interval specified. Note that each event here is an average of daily event ratings for the driver over the given interval.
driving_behavior.event_rating.hard_brake	Hard braking rating of the trip
driving_behavior.event_rating.phone_use	Phone use rating of the trip

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Response Field	Description
driving_behavior.event_rating.acceleration_rating	Acceleration rating of the trip
driving_behavior.event_rating.hard_turn_rating	Hard turn rating of the trip
driving_behavior.event_rating.overspeeding_rating	Overspeeding rating of the trip
speed_profile	An array of tuples containing Driver's speed in MPH, timestamp (Unix timestamp since epoch in milliseconds) and Speed limit on the road segment. The array is in timestamp ascending order.
events	An array containing a list of driving events that happened during the trip. The events are low level details that are reflected in scores.
events[i].latitude_start	Latitude of location where the event started.
events[i].longitude_start	Longitude of location where the event started.
events[i].latitude_end	Latitude of location where the event ended.
events[i].longitude_end	Longitude of location where the event ended.
events[i].start_time	Timestamp of when the event started in ISO format.
events[i].end_time	Timestamp of when the event ended in ISO format.
events[i].event_type	Numeric value associated with event. The possible values are 0 for 'HARD_BRAKE, 1 for RAPID_ACCELERATION, 2 for PHONE_USE, 3 for OVERSPEEDING, 4 for COLLISION, 5 for HARD_TURN, 6 for PHONE_SCREEN_INTERACTION
events[i].event_type_name	Type of driving event. The possible types are **OVERSPEEDING, PHONE_USE, RAPID_ACCELERATION, HARD_BRAKE, HARD_TURN, PHONE_SCREEN_INTERACTION and COLLISION**.
events[i].average_driver_speed_kmph	Average speed of the driver during the event. This is valid only for OVERSPEEDING event.
events[i].max_driver_speed_kmph	Maximum speed of the driver during the event. This is valid only for OVERSPEEDING event
events[i].posted_speed_limit_kmph	Posted legal speed limit where the event occurred. This is valid only for OVERSPEEDING event

Sample Response

```
{
    "info": {
        "insurance_period": "NA",
        "trip_max_speed_kmph": 84.16792964453629,
        "distance_km": 11.023,
        "end_time": "2017-09-07T15:28:32-04:00",
        "tracking_id": "37",
        "duration_seconds": 987.45,
        "start_time": "2017-09-07T15:08:10-04:00",
        "session_id": "1590149475"
    },
    "driving_behavior": {
        "score": {
            "zendrive_score": 88
        },
        "event_rating": {
            "hard_brake_rating": 3,
            "phone_use_rating": 4,
            "rapid_acceleration_rating": 4,
            "hard_turn_rating": 4,
            "overspeeding_rating": 5
        }
```

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```
    },
    "simple_path": [{
            "latitude": 40.7048046,
            "timestamp": "2018-01-25T16:28:35.318000-05:00",
            "longitude": -73.7980828,
            "time_millis": 1516915715318
        },{
            "latitude": 40.7048046,
            "timestamp": "2018-01-25T16:29:10.805000-05:00",
            "longitude": -73.7980314,
            "time_millis": 1516915750805
        }
    ],
    "trip_id": "1504811290303",
    "events": [{
        "event_type": 3,
        "event_type_name": "OVERSPEEDING",
        "latitude_end": 40.9145881796243,
        "longitude_end": -74.2668195549313,
        "longitude_start": -74.2656172626412,
        "latitude_start": 40.9139556857207,
        "average_driver_speed_kmph": 49.535568691545045,
        "max_driver_speed_kmph": 78.98654033076772,
        "end_time": "2017-09-07T15:16:45-04:00",
        "posted_speed_limit_kmph": 32.186854250516596,
        "start_time": "2017-09-07T15:15:56-04:00"
    }, {
        "latitude_end": 40.9182284027719,
        "latitude_start": 40.9182284027719,
        "longitude_end": -74.2960023321903,
        "event_type": 0,
        "event_type_name": "HARD_BRAKE",
        "start_time": "2017-09-07T15:20:28-04:00",
        "longitude_start": -74.2960023321903,
        "end_time": "2017-09-07T15:20:28-04:00"
    }, {
        "latitude_end": 40.9182284027719,
        "latitude_start": 40.9182284027719,
        "longitude_end": -74.2960023321903,
        "event_type": 6,
        "event_type_name": "PHONE_SCREEN_INTERACTION",
        "start_time": "2017-09-07T15:20:28-04:00",
        "longitude_start": -74.2960023321903,
        "end_time": "2017-09-07T15:20:28-04:00"
    }, {
        "latitude_start": 39.7209858723,
        "event_type": 2,
        "event_type_name": "PHONE_USE",
        "start_time": "2015-03-10T18:31:58-06:00",
        "longitude_end": -104.932609689,
        "longitude_start": -104.931542739,
        "latitude_end": 39.7209808562,
        "end_time": "2015-03-10T18:32:07-06:00"
    }],
    "speed_profile":[
        [
            0.6710820000000001,
```

```
            1516915715318,
            "NA"
        ],
        [
            1.0961006,
            1516915716798,
            "NA"
        ],
        [
            0.6710820000000001,
            1516915718789,
            "NA"
        ]
    ]
}
```

1.8.8 Delete Trip

This API endpoint should be used if you want to ignore an existing trip and all its data from future API responses and driver score computations. Once deleted a trip has no impact on the driver's scores any more and hence deletion will lead to change in driver scores.

Note that a trip MUST already exist in Zendrive system for it to be successfully deleted (if a trip and its data is not yet uploaded to server it cannot be deleted). This API endpoint typically should be called after existence of trip is verified by a GET call or after a Webhook callback has been invoked.

```
curl -X DELETE https://api.zendrive.com/v3/driver/{driver_id}/trip/{trip_id}?apikey=
↪{ZENDRIVE_ANALYTICS_API_KEY}
```

Note: `apikey` is the only query parameter.

Response in case of Success

```
{
    "success": true
}
```

Sample Response in case of Failure

```
{
    "error": "trip_id 1426131047984 is not valid"
}
```

1.9 Webhook Notifications API

Zendrive provides the ability to specify a Webhook where you can receive notifications of interesting events and alerts from Zendrive. The Webhook URL can be specified under **Settings** in your account, after you login to Zendrive.

The Webhook URL provided must be a HTTPS URL as the notifications contain private information about your fleet. Notifications are sent as a POST request to the Webhook URL with a data block containing a json string. The json data contains the following fields.

Field	Description
version	Specifies the version of the notification API being sent. Currently, the value of this field is 3. As the notification API evolves, this field will be incremented.
type	The type of this notification as a string. Your application can use this to handle different types of notifications as needed. New notification types may be added incrementally in the API without a bump in the version.
. . .	Additional fields present are notification type specific. They are described along with the description of the different notification types.

1.9.1 Retries

Zendrive will retry notifications to the Webhook in case of all HTTP Errors, Connection Timeouts, SSL Errors, TooManyRedirectErrors. The interval between consecutive retrials increases from 2 min to 15 mins in an exponential fashion, gets capped at 15 mins, is expired after 1 day is elapsed since the first retry.

While it may happen rarely, it is possible that your Webhook receive duplicates of the same notification from Zendrive. Your Webhook handler should take care to handle this correctly as required.

Trip Scored Notification

This notification is sent by Zendrive when a trip uploaded by your application is completely uploaded and scored by the Zendrive backend. Your application can now query the Zendrive API for *Trip Scores* for this trip. The notification data block contains the following fields.

Request Parameter	Description
version	Currently, the value of this field is 3.
type	type for this notification is **TRIP_SCORED**.
driver_id	Id of the driver whose trip was just scored.
trip_id	Id of the trip which was just scored.
data	A dictionary with the following details about the trip. This is available only to applications who are set up to receive trip details via webhook. Contact support@zendrive.com to set this up for your application. Else this field will be an empty dictionary { } • info : Recorded information about the trip [Total kilometers driven, Drive time etc]. • simple_path: A coarse GPS trail of the trip. Useful for visualization of the trip path. • score: Zendrive score of the driver. • speed_profile: The speed profile of the trip as a tuple (Driver's speed in MPH, Timestamp in ms, Speed limit on the road segment). • events: Events detected by Zendrive during the trip. Events like speeding, hard braking, phone use etc are returned.

1.9.2 Sample Notification

```
curl -X POST -H "Content-Type: application/json" -d
'{
    "version": 3,
    "type": "TRIP_SCORED",
    "driver_id": "10101672903689391",
    "trip_id": "1416227804134",
    "data": {}
}' https://webhook'

curl -X POST -H "Content-Type: application/json" -d
'{
    "version": 3,
    "type": "TRIP_SCORED",
    "driver_id": "10101672903689391",
    "trip_id": "1416227804134",
    "data": {
                "info": {
                        "insurance_period": "NA",
                        "trip_max_speed_kmph": 84.16792964453629,
                        "distance_km": 11.023,
                        "end_time": "2017-09-07T15:28:32-04:00",
                        "tracking_id": "37",
                        "duration_seconds": 8769,
                        "start_time": "2017-09-07T15:08:10-04:00",
                        "session_id": "1590149475"
                },
                "driving_behavior": {
                        "score": {
                                "zendrive_score": 90
                        },
                        "event_rating": {
                                "hard_brake_rating": 3,
                                "phone_use_rating": 4,
                                "rapid_acceleration_rating": 3,
                                "overspeeding_rating": 5
                        }
                },
                "simple_path": [
                        {
    "latitude": 40.7048046,
    "timestamp": "2018-01-25T16:28:35.318000-05:00",
    "longitude": -73.7980828,
    "time_millis": 1516915715318
},{
    "latitude": 40.7048046,
    "timestamp": "2018-01-25T16:29:10.805000-05:00",
    "longitude": -73.7980314,
    "time_millis": 1516915750805
}],
                "trip_id": "1416227804134",
                "events": [{
                                "event_type": 3,
                                "event_type_name": "OVERSPEEDING",
                                "latitude_end": 40.9145881796243,
                                "longitude_end": -74.2668195549313,
```

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```
                                        "longitude_start": -74.2656172626412,
                                        "latitude_start": 40.9139556857207,
                                        "average_driver_speed_kmph": 49.535568691545045,
                                        "max_driver_speed_kmph": 78.98654033076772,
                                        "end_time": "2017-09-07T15:16:45-04:00",
                                        "posted_speed_limit_kmph": 32.186854250516596,
                                        "start_time": "2017-09-07T15:15:56-04:00"
                        }]
        }
}' https://webhook
```