

\ Q&A

API .

- - .

1.

retry 2-3-10 API

- 429 Too Many Requests - ..
-

2.

- [v2.1](#)
- [v2.1](#) .
- () 2
 1. access_token - . () .
 2. refresh_token - access_token, refresh_token. - . 1 - .
- . *access_token* [v2.1](#) (*access_token*).
- .

2.

- . , () . " 123 456" vs "a123ec456". " " :
-
-
-
- [v2.1](#)
- " " - (RegNumber) VIN " " () .
- (, %) = " " car_id . , 1.
- - 24, ... () (,)

3.

- [v2.1](#)
- 60 .
- " " ..

4.

- [v2.1](#) .
- 60 2 11 24
- ' , ' .
- GSM, " " , " " .

5.

()

1. **DateFrom** **DateTo** .
2.
 - a. **EndRecordDate** **DateFrom** .
 - b. (- **BaseEvent**)
 - i. **BaseEvent.BeginRecordDate** **DateFrom** , .
 - ii. ,
 1. (- **RequestEvent**).
 2. **BaseEvent.EndRecordDate** **RequestEvent.EndRecordDate**.
 3. **ExtraData**
 4. **RequestEvent** .
 - c. .

ExtraData:

1. **DriverKeyNumber** (**BaseEvent**)

2. Sensors .
 - a. RequestEvent.ExtraData.Sensors BaseEvent.ExtraData.Sensors, BaseEvent.ExtraData.Sensors RequestEvent.ExtraData.Sensors .
3. SpeedLimit BaseEvent.ExtraData SpeedLimit .
4. MaxSpeed BaseEvent.ExtraData MaxSpeed
5. ExtraData RequestEvent

(ExtraData)

```

class Event:
    """ """
    __slots__ = 'type', 'date_from', 'date_to'

    def __init__(self, type, date_from, date_to):
        self.date_from = date_from #
        self.date_to = date_to #
        self.type = type #

    def intersects(self, obj):
        """ """
        return self.date_from <= obj.date_to and self.date_to >= obj.date_from

    def within(self, obj):
        """ """
        return self.date_from >= obj.date_from and self.date_to <= obj.date_to

#####

class Storage:
    """
    """

    __slots__ = 'date_from', 'date_to', 'events'

    def __init__(self, events, date_from, date_to):
        self.events = events # ,
        self.date_from = date_from # -
        self.date_to = date_to # -

    def remove(self, event):
        self.events.remove(event)

    def add(self, event):
        self.events.append(event)
        self.events.sort(key = lambda ev: ev.date_from)

    def get_all_event_types(self):
        types = set()
        for ev in self.events:
            if ev.type not in types:
                types.add(ev.type)

        return types

    def get_all(self):
        return self.events

    def get_events_with_type(self, type):
        return [ ev for ev in self.events if ev.type == type ]

    def get_first_event_with_type(self, type):
        for ev in self.events:
            if ev.type == type:
                return ev

#####

def merge_type(base, request, ev_type):

```

```

"""
    ev_type.
    base -
    request -
    ev_type -
    base.
"""
events = base.get_events_with_type(ev_type)
for ev in events:
    if ev.within(request):
        """
            .
            .
            """
            base.remove(ev)

        elif ev.date_from < request.date_from:
            """
                """

            new_ev = request.get_first_event_with_type(ev_type)
            """
                base request date_from,
            """
            if new_ev is None:
                """
                    ' ( overspeed 3 )
                    - .
                    ( / ) ( 24 ).
                """
                continue

            elif ev.intersects(new_ev):
                """
                    API ' .
                    .
                    """
                    ev.date_to = new_ev.date_to
                    request.remove(new_ev)

for ev in request.get_events_with_type(ev_type):
    """
        """
        base.add( ev )

def merge( base, request ):
    """
        .
        base - DateFrom api.
        request -
        base.
    """
    all_types = base.get_all_event_types() | request.get_all_event_types()
    for type in all_types:
        merge_type(base, request, type)

```

6.

- v2.1 .
- 300
- , .. 8000 , .
- " " .
- :
- 1. .
- 2. .
- 3. " "-1 (95%).

4. ,2 00:00 () 12:00 () 24 " " .

```
:
  2021-10-02 00:00:00 (UTC).

http://api.url/user/1/cars/1/history/full?filter[histState]=gte(RecordDate,2021-10-01T00:00:00Z)
&with_total_count=false

():
  {
    "id": "1633305144000000000",
    "type": "histState",
    "attributes": {
      "RecordDate": "2021-10-01T23:52:24Z",
      "Alt": 68,
      "Direction": 34,
      "Lat": 64.698017,
      "Lon": 76.557623,
      "Sensors": [
        {
          "id": 1,
          "value": 1
        },
        {
          "id": 150,
          "value": 50534.5
        }
      ],
      "Velocity": 31
    }
  }
  2021-10-02 01:00:00 c 2021-10-01T22:52:24Z (RecordDate - 1 )
http://api.url/user/1/cars/1/history/full?filter[histState]=gte(RecordDate,2021-10-01T22:52:24Z)
&with_total_count=false
  - 2021-10-02T00:42:20Z.      2021-10-01T23:42:20Z.
```

- 5. id . . , .
- 6. . id .

7. .

1.

```
GET https://api.url/v2.1/sensors?filter[sensor]=in(Destination,100, 110)
```

2. ,

```
http://api.url/v2.1/user/{user_id}/cars/states/{car_id}
```

3. (Destination=110) .

```

: (id=1) " CAN" (id=67), 2021-09-01() 2021-10-01 () 1) UTC 2021-09-01 () = 2021-
08-31T21:00:00Z
2021-10-01 () = 2021-09-30T21:00:00Z
2)
: GET https://api.url/v2.1/user/1/cars/1/history/full?sort=-RecordDate&filter[histState]=and(exists
(Sensors,67),lte(RecordDate,2021-08-31T21:00:00Z))&fields[histStat]=Sensors.67,RecordDate&limit[page]
=1&with_total_count=false
:
{
  "id": "1634785201000000000",
  "type": "histState",
  "attributes": {
    "RecordDate": "2021-08-31T20:49:51Z",
    "Sensors": [
      {
        "id": 67,
        "value": 25580
      }
    ]
  }
}
3)
: GET https://api.url/v2.1/user/1/cars/1/history/full?sort=-RecordDate&filter[histState]=and(exists
(Sensors,67),lt(RecordDate,2021-09-30T21:00:00Z))&fields[histStat]=Sensors.67,RecordDate&limit[page]
=1&with_total_count=false
:
{
  "id": "1634785201000000000",
  "type": "histState",
  "attributes": {
    "RecordDate": "2021-08-31T20:49:51Z",
    "Sensors": [
      {
        "id": 67,
        "value": 26168
      }
    ]
  }
}

26168 - 25580 = 588 .

```

4. , (Destination=100). = (-)+ - . / ,

```

4. (id=1) 3
1. 1 (id=12)
2. 2 (id=68)
3. CAN (id=55)
2021-09-01() 2021-10-01 ()
1) UTC
2021-09-01 () = 2021-08-31T21:00:00Z
2021-10-01 () = 2021-09-30T21:00:00Z
2)
GET https://api.url/v2.1/user/1/cars/1/history/full?sort=-RecordDate&filter[histState]=and(exists
(Sensors,12,68,55),lte(RecordDate,2021-08-31T21:00:00Z))&fields[histStat]=Sensors.12,Sensors.68,Sensors.
55,RecordDate&limit[page]=1&with_total_count=false
:
{
  "id": "1634785201000000000",
  "type": "histState",
  "attributes": {
    "RecordDate": "2021-08-31T20:49:51Z",
    "Sensors": [
      {
        "id": 12,
        "value": 24
      },
      {
        "id": 68,

```

```

        "value": 67
      }
    ]
  }
}
3)      ( 55) .
GET https://api.url/v2.1/user/1/cars/1/history/full?sort=-RecordDate&filter[histState]=and(exists
(Sensors,12,68,55),lte(RecordDate,2021-08-31T21:00:00Z))&fields[histStat]=Sensors.12,Sensors.68,Sensors.
55,RecordDate&limit[page]=1&with_total_count=false
:
{
  "id": "1634785201000000000",
  "type": "histState",
  "attributes": {
    "RecordDate": "2021-08-31T20:47:51Z",
    "Sensors": [
      {
        "id": 55,
        "value": 110
      }
    ]
  }
}
}
4)
: GET https://api.url/v2.1/user/1/cars/1/history/full?sort=-RecordDate&filter[histState]=and(exists
(Sensors,12,68,55),lt(RecordDate,2021-09-30T21:00:00Z))&fields[histStat]=Sensors.12,Sensors.68,Sensors.
55,RecordDate&limit[page]=1&with_total_count=false
:
{
  "id": "1634785201000000000",
  "type": "histState",
  "attributes": {
    "RecordDate": "2021-08-31T20:49:51Z",
    "Sensors": [
      {
        "id": 12,
        "value": 22
      },
      {
        "id": 68,
        "value": 77
      },
      {
        "id": 55,
        "value": 120
      }
    ]
  }
}
}
5)
6)      (fueling) (drain) .
: GET https://api.url/v2.1/user/1/cars/1/history/events/2021-08-31T21:00:00Z/2021-09-30T21:00:00Z?filter
[histState]=in(Type,'fueling','drain')
:
  "data": [
    {
      "id": "1627897795018180000.fueling",
      "type": "history_event",
      "attributes": {
        "BeginRecordDate": "2021-09-02T09:49:55Z",
        "EndRecordDate": "2021-09-02T09:53:35Z",
        "BeginRecordId": "1627897795018180000",
        "EndRecordId": "1627898015018200000",
        "Type": "fueling",
        "BeginCoords": {
          "Lon": 37.9680443,
          "Lat": 55.7403755
        },
        "EndCoords": {
          "Lon": 37.9679985,
          "Lat": 55.7403221
        }
      }
    }
  ]
}

```

```

    },
    "ExtraData": {
      "RefilledVolume": 49.33
    }
  },
  {
    "id": "1628010815039700000.fueling",
    "type": "history_event",
    "attributes": {
      "BeginRecordDate": "2021-09-13T17:13:35Z",
      "EndRecordDate": "2021-09-13T17:20:55Z",
      "BeginRecordId": "1628010815039700000",
      "EndRecordId": "1628011255039750000",
      "Type": "fueling",
      "BeginCoords": {
        "Lon": 37.6203613,
        "Lat": 55.4579086
      },
      "EndCoords": {
        "Lon": 37.6204224,
        "Lat": 55.4579735
      },
      "ExtraData": {
        "RefilledVolume": 48.58
      }
    }
  },
  {
    "id": "1628010815139700000.fueling",
    "type": "history_event",
    "attributes": {
      "BeginRecordDate": "2021-09-13T17:13:35Z",
      "EndRecordDate": "2021-09-13T17:20:55Z",
      "BeginRecordId": "1628010815039700000",
      "EndRecordId": "1628011255039750000",
      "Type": "fueling",
      "BeginCoords": {
        "Lon": 37.6203613,
        "Lat": 55.4579086
      },
      "EndCoords": {
        "Lon": 37.6204224,
        "Lat": 55.4579735
      },
      "ExtraData": {
        "RefilledVolume": 68.58
      }
    }
  },
  {
    "id": "1628010815239700000.fueling",
    "type": "history_event",
    "attributes": {
      "BeginRecordDate": "2021-09-21T17:13:35Z",
      "EndRecordDate": "2021-09-21T17:20:55Z",
      "BeginRecordId": "1628010815039700000",
      "EndRecordId": "1628011255039750000",
      "Type": "fueling",
      "BeginCoords": {
        "Lon": 37.6203613,
        "Lat": 55.4579086
      },
      "EndCoords": {
        "Lon": 37.6204224,
        "Lat": 55.4579735
      },
      "ExtraData": {
        "RefilledVolume": 45.73
      }
    }
  }
}

```

```

    },
    {
      "id": "1628166847003460000.drain",
      "type": "history_event",
      "attributes": {
        "BeginRecordDate": "2021-08-15T12:34:07Z",
        "EndRecordDate": "2021-08-15T12:37:58Z",
        "BeginRecordId": "1628166847003460000",
        "EndRecordId": "1628167078003490000",
        "Type": "fueling",
        "BeginCoords": {
          "Lon": 37.9680595,
          "Lat": 55.7403564
        },
        "EndCoords": {
          "Lon": 37.9680176,
          "Lat": 55.7402725
        },
        "ExtraData": {
          "DrainVolume": 10.61
        }
      }
    },
    {
      "id": "1628166845003460000.drain",
      "type": "history_event",
      "attributes": {
        "BeginRecordDate": "2021-08-17T12:34:07Z",
        "EndRecordDate": "2021-08-17T12:37:58Z",
        "BeginRecordId": "1628166847003460000",
        "EndRecordId": "1628167078003490000",
        "Type": "fueling",
        "BeginCoords": {
          "Lon": 37.9680595,
          "Lat": 55.7403564
        },
        "EndCoords": {
          "Lon": 37.9680176,
          "Lat": 55.7402725
        },
        "ExtraData": {
          "DrainVolume": 3.6
        }
      }
    }
  ],
  7) : : (24 + 67 + 110 - 22-77-120) = -18 : 49.33 + 48.58 + 68.58 + 45.73 = 212.22
      : 10.61 + 3.6 = 14.21

      : -18 + 212.22 - 14.21 = 180.01

```