

DATA STREAMER GUIDE

BUSINESS SMART CONNECT

Telekom Deutschland GmbH

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1. Introduction

The data streamer interface of the Business Smart Connect portal offers the possibility to become directly informed about Business Smart Connect SIM-card events or Business Smart Connect Portal events.

Usage data and event data, such as API Activities, are available. Event subscription is managed in the configuration panel, where the different streams can be set up separately or combined (Usage Data, Events and Usage Data & Events).

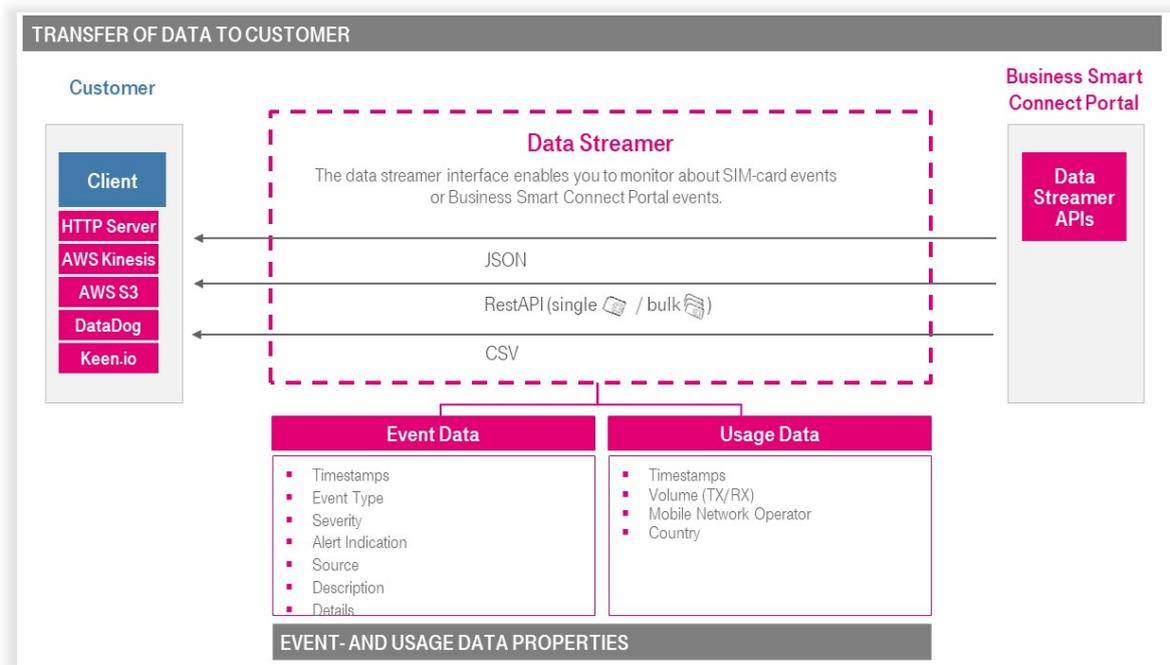


Figure 1: transfer of event- and usage data to customers' systems

The used data format complies with the JSON standard requirements, thus making the processing data in your own databases or reporting systems easier to implement.

The interface supports REST-API and cloud service such as AWS Kinesis, AWS S3 and DataDog.

2. Configuring data streams in Customer Portal

To manage your data streams, move your mouse over "Settings" in the main navigation and select the sub menu "Data Streamer". You will get to the data streamer overview menu.

Here you can configure a new stream and change the configuration of an existing data stream.

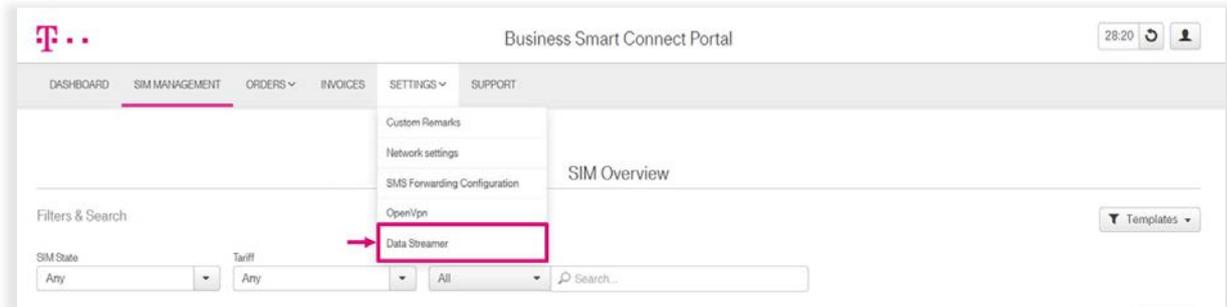


Figure 2: Access to data stream configuration via the main navigation

2.1 Overview page

You can create new data streams or manage already configured data streams through the data stream overview section.

STRUCTURE OF THE OVERVIEW PAGE

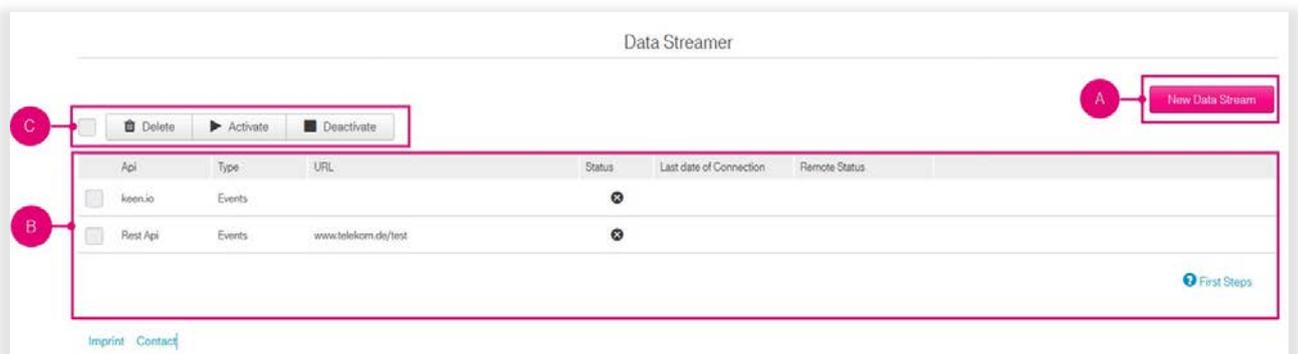


Figure 3: Access to data stream configuration via the main navigation

A) Create new data stream

Click the "New Data Stream" button if you want to create a new data stream. You will be taken to another page where you can create a new data stream (see section configuration in customer portal).

B) Table with configured data streams

The activated and configured streams are shown in tabular form, and the performance can be monitored. Here you get further information about the data streams.

These are listed as follows:

API:

Describes the API-method used for transferring data to the customer's environment.

Type:

Type of data being transferred in the stream (usage data, events and usage data & events)

URL:

Shows the URL destination for Rest-API and Rest-API (bulk). The data stream acts as an HTTP Client and needs an HTTP Server to handle each message.

Last data of connection:

The time stamp shows when data was last transferred, resp. when the last connection was successfully established.

Remote status:

Remote status of the data stream; indicates whether the data stream is operating normally. The "active" http status code indicates that the stream is operating normally. On the other hand, the "deactivated" status code indicates that the configuration is invalid, or that the receiving end is not reachable.

C) Delete, deactivate or activate data stream

If you want to delete a data stream, please click the "Delete" button. This will open a confirmation dialog, where you will be asked if you really want to delete this data stream. To delete the data stream, please click on "Delete" in the confirmation dialog.

The dialog window will be closed, and the data stream will be removed from the table.

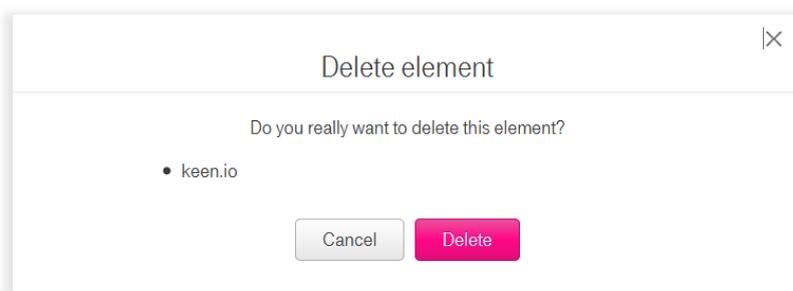


Figure 4: Confirmation window for deleting data stream

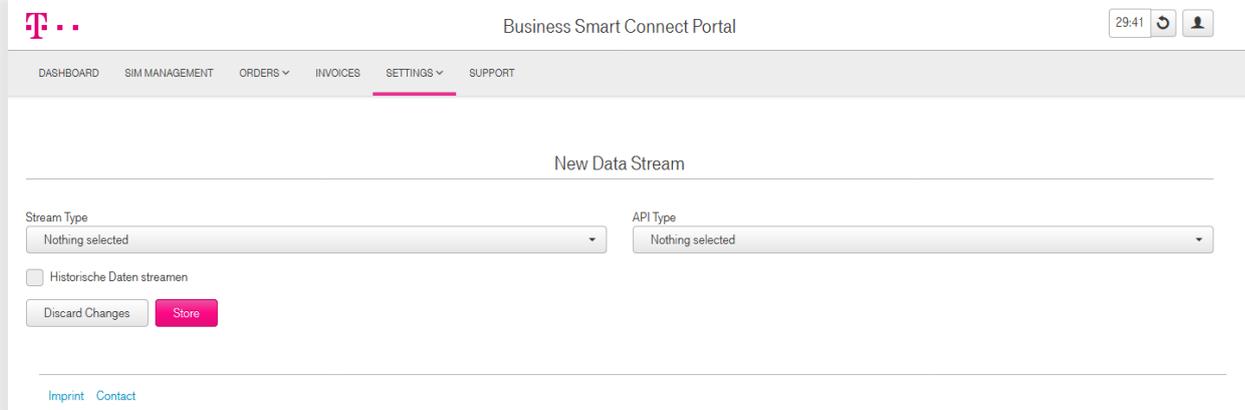
Should you decide to not delete the data stream, then click "Cancel" in the confirmation dialog. The dialog window will be closed, without the stream being deleted.

If you want to pause the data stream, please click the "Deactivate" button. This action initiates the deactivation of the activated stream.

If you want to resume the data stream, please click the "Activate" button. This action initiates the activation of the paused stream.

2.2 Configuration in Customer Portal

On the data stream configuration page all configuration options are available. You can specify the stream type as well as the API type, choose to transfer historic data.



The screenshot shows the 'Business Smart Connect Portal' interface. At the top, there is a navigation bar with the following items: DASHBOARD, SIM MANAGEMENT, ORDERS, INVOICES, SETTINGS (highlighted), and SUPPORT. The main content area is titled 'New Data Stream'. It contains two dropdown menus: 'Stream Type' and 'API Type', both currently showing 'Nothing selected'. Below these is a checkbox labeled 'Historische Daten streamen'. At the bottom of the form are two buttons: 'Discard Changes' and 'Store'. The footer of the page includes links for 'Imprint' and 'Contact'.

Figure 5: Configuration page for a data stream

Three stream types are available: Usage data, Event data or Usage & Event data combined. Take note that if the transfer of historic data is chosen up to 7 days of historic data will be send, before live data is transferred.

The interface supports REST-API and cloud service such as AWS Kinesis or DataDog.

To set-up a data stream for a Rest-API or Rest-API in Bulk mode, the specification of an API Callback is required. The data stream acts as an HTTP Client and needs an HTTP Server on your side to answer each message. Every sent message includes one or more objects.

After you have specified the configuration, please click “Store” to activate the stream. If successful, the overview page is automatically displayed, and the stream is activated. Here, you are shown the status of the connection resp. remote status.

3. Available event data

Event data displays the current states of your SIMs and changes to the SIM card, like the creation of a new PDP-context or issue. This gives you the option to set-up a monitoring for certain events or an alarming, if needed.

This chapter provides an overview all possible event types and properties.

OVERVIEW OF EVENT TYPES

For every event, which is being send by the BSC-Portal, an event ID and description provided:

ID	Description
0	Generic
1	Update location
2	Update GPRS location
3	Create PDP Context
4	Update PDP Context
5	Delete PDP Context
6	User authentication failed
7	Application authentication failed
8	SIM activation
9	SIM suspension
10	SIM deletion
11	Endpoint blocked
12	Organisation blocked
13	Support Access
14	Multi-factor Authentication
15	SMS API Callback

3.1 Event properties

The following properties are included in all events sent:

#	Property	Data Type	Description
1	id	Numeric	Unique identifier of this event, if multiple events with same id are received (e.g. due to transmission errors) these should be treated by the receiver as duplicates
2	timestamp	Timestamp	Date/time when this event happened
3	event_type	Nested Object	Type of the event, see below for details
4	event_severity	Nested Object	Severity of the event, see below for details
5	event_source	Nested Object	Source of the event, see below for details
6	organisation	Nested Object	Customer account associated with this event, see below for details
7	alert	Boolean	Event is a candidate to be alerted to a user
8	description	String	Human readable description of the event

You can see additional properties for event types related to SIM cards or users:

#	Property	Data Type	Description
1	imsi	Nested Object	Details of IMSI, see below for details (in a multi-IMSI
2	sim	Nested Object	Details of SIM, see below for details (in case of multi-IMSI configuration multiple different IMSIs may be reported for the same SIM)
3	endpoint	Nested Object	Details of Endpoint, see below for details

3.2 Properties of details object

#	Property	Data Type	Description
1	id	Numeric	Unique identifier of the actual used mobile network operator
2	name	String	Name of the mobile network operator
3	country	Nested Object	Country of mobile network operator
4	country.id	Numeric	Unique identifier of the country
5	country.name	String	Name of country
6	country.country_code	String	Country code
7	country.mcc	String	Mobile Country Code (MCC)
8	country.iso_code	String	ISO code
9	pdp_context	Nested Object	PDP Context Details
10	volume	Nested Object	Volume consumed in PDP Context
11	volume.rx	Number with up to 6 decimal places	Downstream Volume in MB
12	volume.tx	Number with up to 6 decimal places	Upstream Volume in MB.
13	volume.total	Number with up to 6 decimal places	Total volume

3.3 Properties of PDP Context

#	Property	Data Type	Description
1	pdp_context_id	String	Unique identifier of this PDP context
2	tunnel_created	Timestamp	Date/time when this PDP context was created
3	gtp_version	String	GTP Version, 1 or 2
4	ggsn_control_plane_ip_address	String	IP Address of GGSN/PGW Control Plane
5	ggsn_data_plane_ip_address	String	IP Address of GGSN/PGW Data Plane
6	sgsn_control_plane_ip_address	String	IP Address of SGSN/SGW Control Plane
7	sgsn_data_plane_ip_address	String	IP Address of SGSN/SGW Data Plane
8	region	String	Region where Data Plane is located
9	breakout_ip	String	IP Address used for Internet Breakout
10	apn	String	Access Point Name (APN)
11	nsapi	Integer	Network Service Access Point Identifier (NSAPI)
12	ue_ip_address	String	IP address assigned to Endpoint
13	imeisv	String	IMEISV
14	mcc	String	Mobile Country Code (MCC)
15	mnc	String	Mobile Network Code (MNC)
16	lac	Integer	Location Area Code (LAC)
17	sac	Integer	Service Area code (SAC)
18	rac	Integer	Routing Area code (RAC)
19	ci	Integer	Cell Identification (CI)
20	rat_type	Integer	Radio Access Type (RAT) (1=3G, 2=2G, 3=WLAN, 4=GAN, 5=HSPA+, 6=4G)

3.4 Properties of IMSI Object

#	Property	Data Type	Description
1	id	Numeric	Unique identifier of this IMSI
2	imsi	String	International mobile subscriber identity (IMSI)
3	import_date	Timestamp	Date/Time this IMSI was provisioned

3.5 Properties of SIM Object

#	Property	Data Type	Description
1	id	Numeric	Unique identifier of this SIM
2	iccid	String	Integrated Circuit Card identifier (ICCID) <i>without</i> checksum digit
3	msisdn	String	MSISDN
4	production_date	Timestamp	Date/Time this SIM chip was produced

4. Available usage data

Often the use of a SIM is tied to a specific location, a region and/or to the usage in a specific device. If SIM utilization deviates from intended usage, this could be an indication about an unusual operating situation or even about the attempt at fraudulent use or misuse. Usage data allows you to monitor all SIM cards.

#	Property	Data type	Description
1	imsi	15 digits numeric string	Currently used IMSI
2	endpoint.id	Numeric	Unique identifier of endpoint
3	sim.id	Numeric	Unique identifier of SIM
4	sim.iccid	19 digits numeric string	ICCID of SIM
5	organisation.id	Numeric	Unique identifier of customer account
6	organisation.name	String	Name of customer account
7	operator.id	Numeric	Unique identifier of visited operator
8	operator.name	String	Name of that mobile operator
9	operator.country.id	Numeric	Unique identifier of visited country
10	operator.country.name	String	Name of visited country
11	tariff.id	Numeric	Unique identifier of applied tariff
12	tariff.name	String	Name of Tariff
13	tariff.ratezone.id	Numeric	Unique identifier of applied rate zone
14	tariff.ratezone.name	String	Name of Rate zone
15	traffic_type.id	Numeric	Unique identifier of traffic type
16	traffic_type.name	String	Name of traffic type

5. JSon Samples

5.1 Event Data json sample

5.1.1 Update Location event sample

```
{
  "id": 2013707XX,
  "alert": false,
  "description": "New location received from VLR for IMSI='901405300000170XXXX', now attached to
VLR=' 491700160000'.",
  "timestamp": "2019-07-17T16:28:00.000+0000",
  "event_type": {
    "id": 1,
    "description": "Update location"
  },
  "event_source": {
    "id": 0,
    "description": "Network"
  },
  "event_severity": {
    "id": 0,
    "description": "Info"
  },
  "organisation": {
    "id": 80025,
    "name": "WBV Tester"
  },
  "endpoint": {
    "id": 8638726,
    "name": "GPS Tracker",
    "ip_address": "100.122.44.249",
    "tags": null,
    "imei": "86278903989XXXX"
  },
  "imsi": {
    "id": 205672,
    "imsi": "901405300000170XXXX",
    "import_date": ""2019-06-10T14:12:01.000+0000"
  },
  "sim": {
    "id": 274887,
    "iccid": "898822806670000XXXX",
    "production_date": "2019-06-17T11:11:11.000+0000"
  },
  "detail": {
    "id": 3,
    "name": "Telekom",
    "country": {
      "id": 74,
      "name": "Germany",
      "country_code": "49",
      "mcc": "262",
      "iso_code": "de"
    },
    "tapcode": [{
      "id": 2,
      "tapcode": "DEUD2"
    }],
    "mnc": [{
      "id": 3,
      "mnc": "02"
    }
  ]
}
```

5.1.2 Delete PDP Context Event Sample

```
{
  "id": 2013707XX,
  "alert": false,
  "description": "PDP Context deleted.",
  "timestamp": "2019-07-12T17:04:59.000+0000",
  "event_type": {
    "id": 5,
    "description": "Delete PDP Context"
  },
  "event_source": {
    "id": 0,
    "description": "Network"
  },
  "event_severity": {
    "id": 0,
    "description": "Info"
  },
  "organisation": {
    "id": 80025,
    "name": " WBV Tester "
  },
  "endpoint": {
    "id": 8427408,
    "name": "GPS Tracker",
    "ip_address": "100.122.44.249",
    "tags": null,
    "imei": "86278903989916XXX"
  },
  "imsi": {
    "id": 372566,
    "imsi": "901405300000170XXXX ",
    "import_date": "2019-06-10T14:12:01.000+0000"
  },
  "sim": {
    "id": 319318,
    "iccid": "8898822806670000XXXX",
    "production_date": "2019-06-17T11:11:11.000+0000"
  },
  "detail": {
    "id": 48,
    "name": "SFR Cegetel",
    "volume": {
      "rx": 0.012671,
      "tx": 0.01148,
      "total": 0.024151
    },
    "pdp_context": {
      "mcc": "310",
      "tunnel_created": "2019-12-11T05:49:29",
      "ggsn_control_plane_ip_address": "185.57.216.XX",
      "pdp_context_id": "162094787",
      "imeisv": "898830300123456XXXX",
      "region": "eu-west-1",
      "lac": 40484,
      "sac": 61142,
      "rat_type": 1,
      "gtp_version": "4",
      "ue_ip_address": "100.105.197.XX",
      "mnc": "260",
      "sgsn_data_plane_ip_address": "216.155.166.XXX",
      "ci": null,
      "apn": null,
      "tx_teid_control_plane": 2667756875,
      "rx_teid": 2720724,
      "rac": null,
      "imsi": "901405300000170XXXX "
    }
  }
}
```

```

        "sgsn_control_plane_ip_address": "216.155.165.XXX",
        "nsapi": 6,
        "breakout_ip": null,
        "ggsn_data_plane_ip_address": "185.57.216.XX",
        "tx_teid_data_plane": 3095978
    },
    "country": {
        "id": 68,
        "name": "France",
        "country_code": "33",
        "mcc": "208",
        "iso_code": "fr"
    }
}
}

```

5.1.3 User authentication failed Event Sample

```

{
    "id": 201388127,
    "alert": false,
    "description": "Failed authentication request from 'user@beispiel.com', Reason: Invalid password from IP
9.9.9.9",
    "timestamp": "2019-05-10T05:42:00.000+0000",
    "event_type": {
        "id": 6,
        "description": "User authentication failed"
    },
    "event_source": {
        "id": 2,
        "description": "API"
    },
    "event_severity": {
        "id": 1,
        "description": "Warn"
    },
    "organisation": {
        "id": 839921,
        "name": "WBV Tester"
    },
    "user": {
        "id": 84993,
        "username": "user@company.com",
        "name": "John Do"
    }
}

```

5.2 Usage Data json sample

```
{
  "cost": 0.00558275,
  "id": 174321498,
  "operator": {
    "id": 4,
    "name": "Telekom",
    "country": {
      "id": 74,
      "name": "Germany"
    }
  },
  "organisation": {
    "id": 80025,
    "name": "WBV Tester"
  },
  "tariff": {
    "ratezone": {
      "id": 83,
      "name": "Europe_I"
    },
    "id": 64,
    "name": "Global Pro I"
  },
  "traffic_type": {
    "id": 5,
    "name": "Data"
  },
  "endpoint": {
    "id": 8392037
  },
  "imsi": "901405300000170XXXX ",
  "volume": {
    "rx": 0.0138,
    "tx": 0.008531,
    "total": 0.022331
  },
  "start_timestamp": "2019-07-17 08:21:11",
  "sim": {
    "iccid": "898822806670000XXXX",
    "id": 233746
  },
  "currency": {
    "symbol": "€",
    "code": "EUR",
    "id": 1
  },
  "end_timestamp": "2019-07-17 08:22:00"
}
```

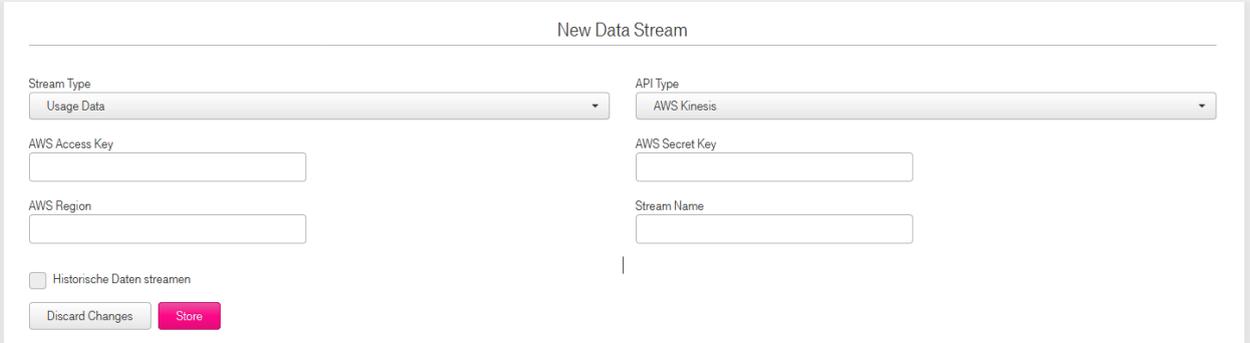
6. Supported Cloud Services

The interface supports REST-API and third-party cloud services such as AWS Kinesis or DataDog. In the select box "API-Type" you will find a list of all supported cloud services, which can be integrated, as well as the necessary fields that need to be filled. There you can select the cloud service in use by your company.

To integrate a cloud service, you are suggested to execute the following steps.

6.1 AWS Kinesis

Messages from the BSC-Platform to AWS Kinesis are authenticated and authorized using your AWS Access Key and the secret key. As the keys are only known to you, you need to make sure that the keys hold the necessary rights to write data to all kinesis data streams, or the desired data stream.



The screenshot shows a web form titled "New Data Stream". It contains the following fields and controls:

- Stream Type:** A dropdown menu with "Usage Data" selected.
- API Type:** A dropdown menu with "AWS Kinesis" selected.
- AWS Access Key:** A text input field.
- AWS Secret Key:** A text input field.
- AWS Region:** A text input field.
- Stream Name:** A text input field.
- Historische Daten streamen:** A checkbox that is currently unchecked.
- Buttons:** "Discard Changes" (grey) and "Store" (pink).

Figure 6: Integration of AWS Kinesis

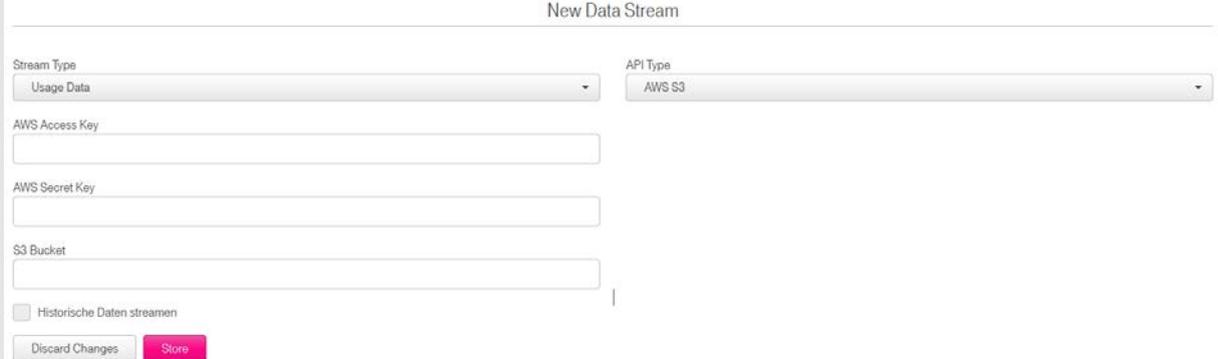
To reduce any issues, please use AWS Identity and Access Management (IAM) to create a dedicated IAM-user for each connection.

Also make sure to specify the AWS region and the name of the stream where the data shall be stored.

Files are delivered in JSON-format to the AWS Kinesis stream.

6.2 AWS S3

Messages from the BSC-Platform to AWS S3 are authenticated and authorized using your AWS Access Key and the secret key. As the keys are only known to you, you need to make sure that the keys hold the necessary rights to write data to all S3 Buckets, or the desired bucket.



The screenshot shows a web form titled "New Data Stream". It contains the following fields and controls:

- Stream Type:** A dropdown menu with "Usage Data" selected.
- API Type:** A dropdown menu with "AWS S3" selected.
- AWS Access Key:** A text input field.
- AWS Secret Key:** A text input field.
- S3 Bucket:** A text input field.
- Historische Daten streamen
- Buttons:** "Discard Changes" and "Store".

Figure 7: Integration of AWS S3

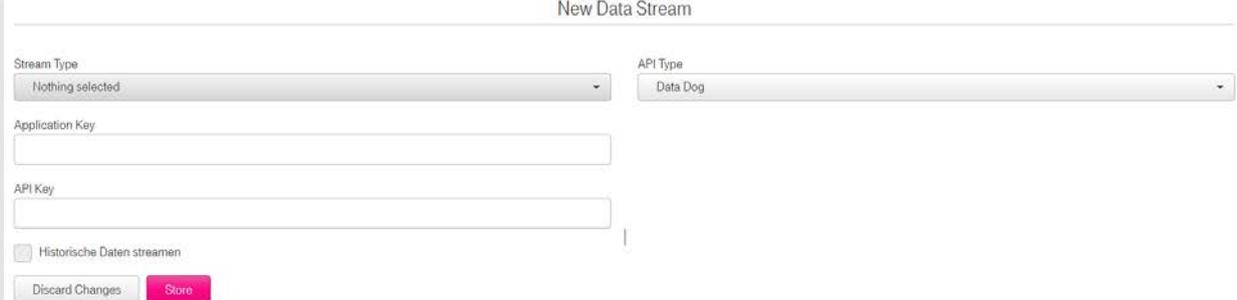
Also, specify the name of the S3 Bucket you want to transfer your data to. Files are delivered as CSV-files to the S3 Bucket. The file names are delivered in a simple structure. Following format applies for:

- Event data: format events_YYYYMMDD_HHmss.csv
- Usage data: cdr_YYYYMMDD_HHmss.csv

Finally, to reduce any issues, please use AWS Identity and Access Management (IAM) to create a dedicated IAM-user for each connection.

6.3 DataDog

The integration with DataDog enables you to monitor and analyze your SIM card usage, at any time. Once configured, data is sent automatically to DataDog, where it can be seen in the DataDog explorer or your customer individual dashboard. The data in form of measurements can be further managed or processed for alarming purposes.



The screenshot shows a web form titled "New Data Stream". It contains two dropdown menus: "Stream Type" (set to "Nothing selected") and "API Type" (set to "Data Dog"). Below these are two text input fields for "Application Key" and "API Key". There is a checkbox labeled "Historische Daten streamen" which is currently unchecked. At the bottom, there are two buttons: "Discard Changes" and "Store".

Figure 9: Integration of DataDog

Messages from the BSC-Platform to Datadog are authenticated and authorized using your application key and API key.

Files are delivered in JSON-format to the DataDog. The following usage data is sent:

- endpoint.volume
- endpoint.volume_tx (*tx = Transmit. So, tx volume counts data send from the device to network*)
- endpoint.volume_rx (*rx = Receive. So, rx volume counts data from network to device*)
- endpoint.cost (*fictive value which is the total volume just with a € behind.*)