Oracle Norge/OUGN webinarer

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From Edge to ML

Hands On lab on IOT/Edge computing with Arduino based sensors

10/6, 2021

Webinaret starter kl 15:00

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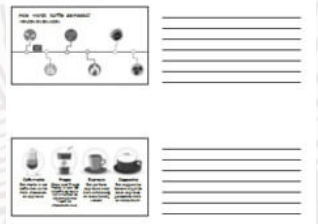
Still gjerne med Q&A knappen når som helst

Mikrofonen din er dempet

Bruk Q&A



Slides vil bli delt

From Edge to ML

~~11/5-2021 Hands On lab on IOT/Edge computing with Arduino based sensors~~

~~27/5-2021 Applied Machine Learning based on sensor data, with Auto ML~~

10/6-2021 An intelligent app with APEX low-code, extended with Machine Learning

https://go.oracle.com/LP=109857?elqCampaignId=294067

Agenda

Where are we?

JSON Data collection, SODA, Convert JSON data to relational

APEX integration with JSON Data

APEX integration with ML

https://github.com/bios62/meetups/tree/bios62-11-05-2021-arduino-lab

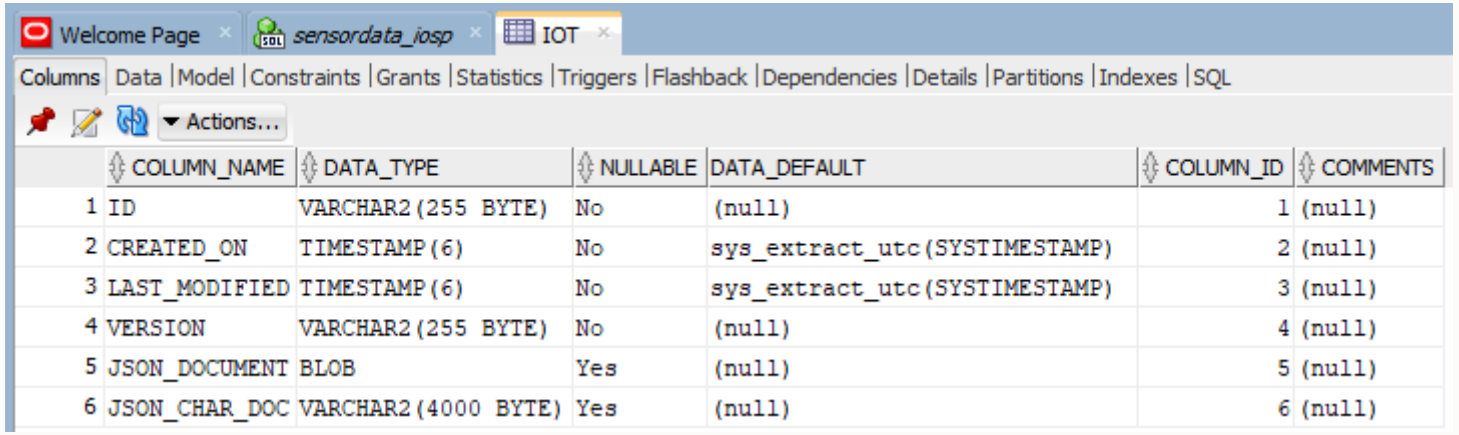
While we talk....

You can reserve a workshop environmenton LiveLabs:

OML4Py LiveLab

https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/view-workshop?wid=786

SODA Data



	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	ID	VARCHAR2(255 BYTE)	No	(null)	1	(null)
2	CREATED_ON	TIMESTAMP(6)	No	sys_extract_utc(SYSTIMESTAMP)	2	(null)
3	LAST_MODIFIED	TIMESTAMP(6)	No	sys_extract_utc(SYSTIMESTAMP)	3	(null)
4	VERSION	VARCHAR2(255 BYTE)	No	(null)	4	(null)
5	JSON_DOCUMENT	BLOB	Yes	(null)	5	(null)
6	JSON_CHAR_DOC	VARCHAR2(4000 BYTE)	Yes	(null)	6	(null)


```
select json_serialize(json_document) from iot
where created_on>to_date('09.06.2021 00:00:00','DD.MM.YYYY HH24:MI:SS');
```

```
create table iotrelational
    (id varchar2(255),
    created_on timestamp,
    last_modified timestamp,
    tempmc integer,
    pres integer,
    hum  integer,
    airq integer);
/
```

Create Relational table based on JSON doc store

```
insert into iotrelational (id,created_on,last_modified,tempmc,pres,hum,airq)
select id,created_on,last_modified,
                json_value(json_document,'$.sensordata[0].sensorvalue') tempmc,
                json_value(json_document,'$.sensordata[1].sensorvalue') pres,
                json_value(json_document,'$.sensordata[2].sensorvalue') airq,
                json_value(json_document,'$.sensordata[3].sensorvalue') hum
                from iot;
Commit;
```

JSON table function

```
SELECT jt.*
FROM iot_raw,
JSON_TABLE(json_document, '$.items[*]'
COLUMNS (row_number FOR ORDINALITY,
         id varchar2(255) PATH '$.id',
         last_modified timestamp PATH '$.lastModified',
         created_on timestamp PATH '$.created',
         object_name varchar2(255) PATH '$.value.objectname',
         TempMC integer PATH '$.value.sensordata[0].sensorvalue',
         Pres integer PATH '$.value.sensordata[1].sensorvalue',
         Hum integer PATH '$.value.sensordata[2].sensorvalue',
         AirQ integer PATH '$.value.sensordata[3].sensorvalue'
         )
         )
AS jt
```

Agenda

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https://github.com/bios62/meetups/tree/bios62-11-05-2021-arduino-lab

Build SODA JSON Collection

Create SODA Collection

Require to enable user for SODA
PUT Request creates collection
POST Request inserts into collection
GET Request fetches from collection
DELETE Request drops collection

All operations require basic authentication with DB User/password
Prior to work with SODA the following needs to be in place:

- Grant SODA_APP, and resource to the user
- ORDS/REST enable the schema

Autonomous Transaction Process | Oracle Database Actions | SQL

tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensordata/_sdw/?nav=worksheet

Apps | Gmail | YouTube | Maps | Oracle Cloud Ops P... | Reading list

ORACLE Database Actions | SQL

SENSORDATA

Development

- SQL
- Data Modeler
- REST
- JSON

Administration

- Database Users

Monitoring

- Real Time SQL Monitor

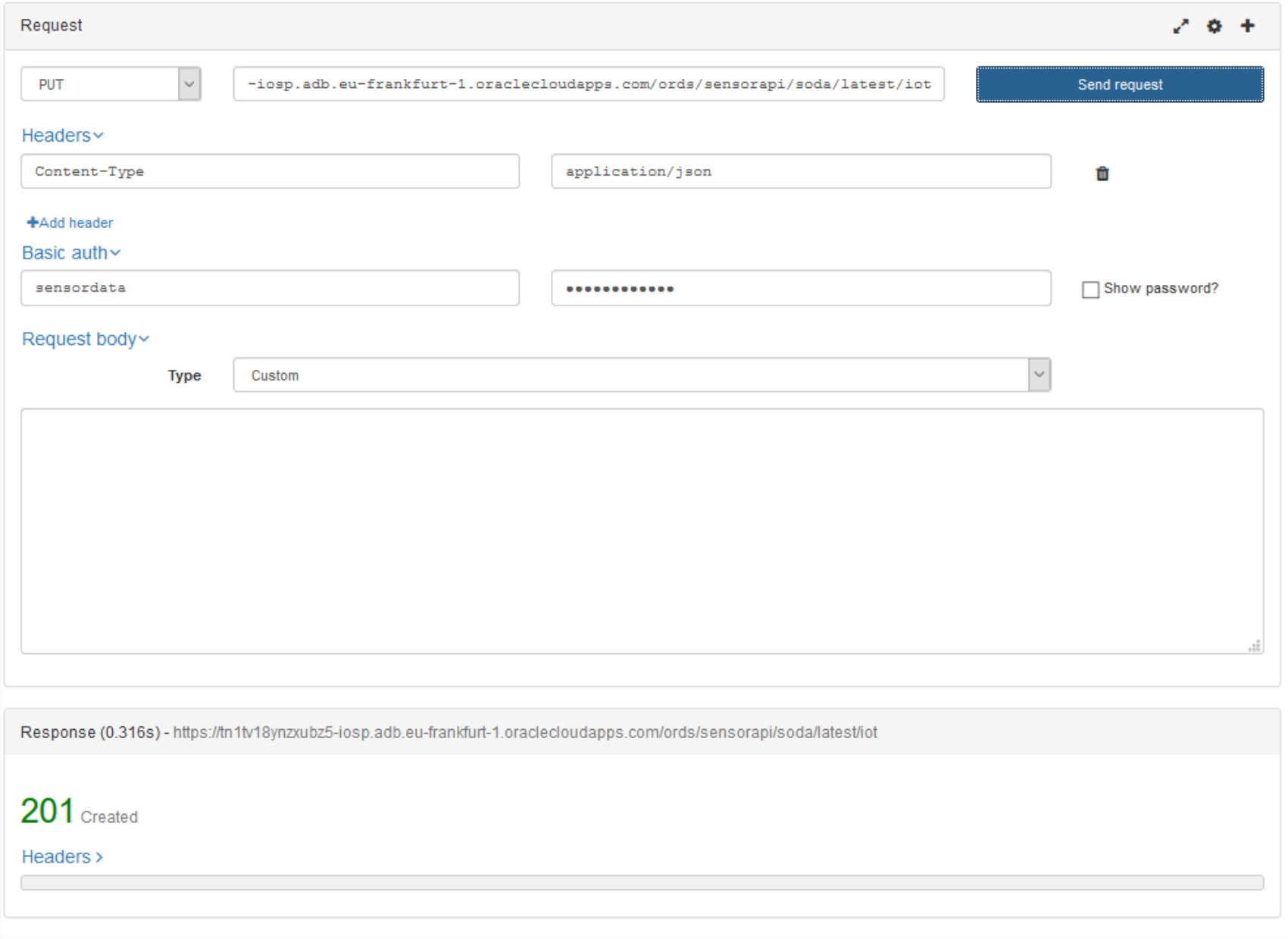
```
'declare
  id sensors.id%type;
BEGIN
  INSERT INTO sensors(objectname, sensorname, sensorvalue)
    VALUES (:objectname,:sensorname,:sensorvalue)
  RETURNING ID INTO id;
  :status := 201;
END;'
    );
  COMMIT;
```

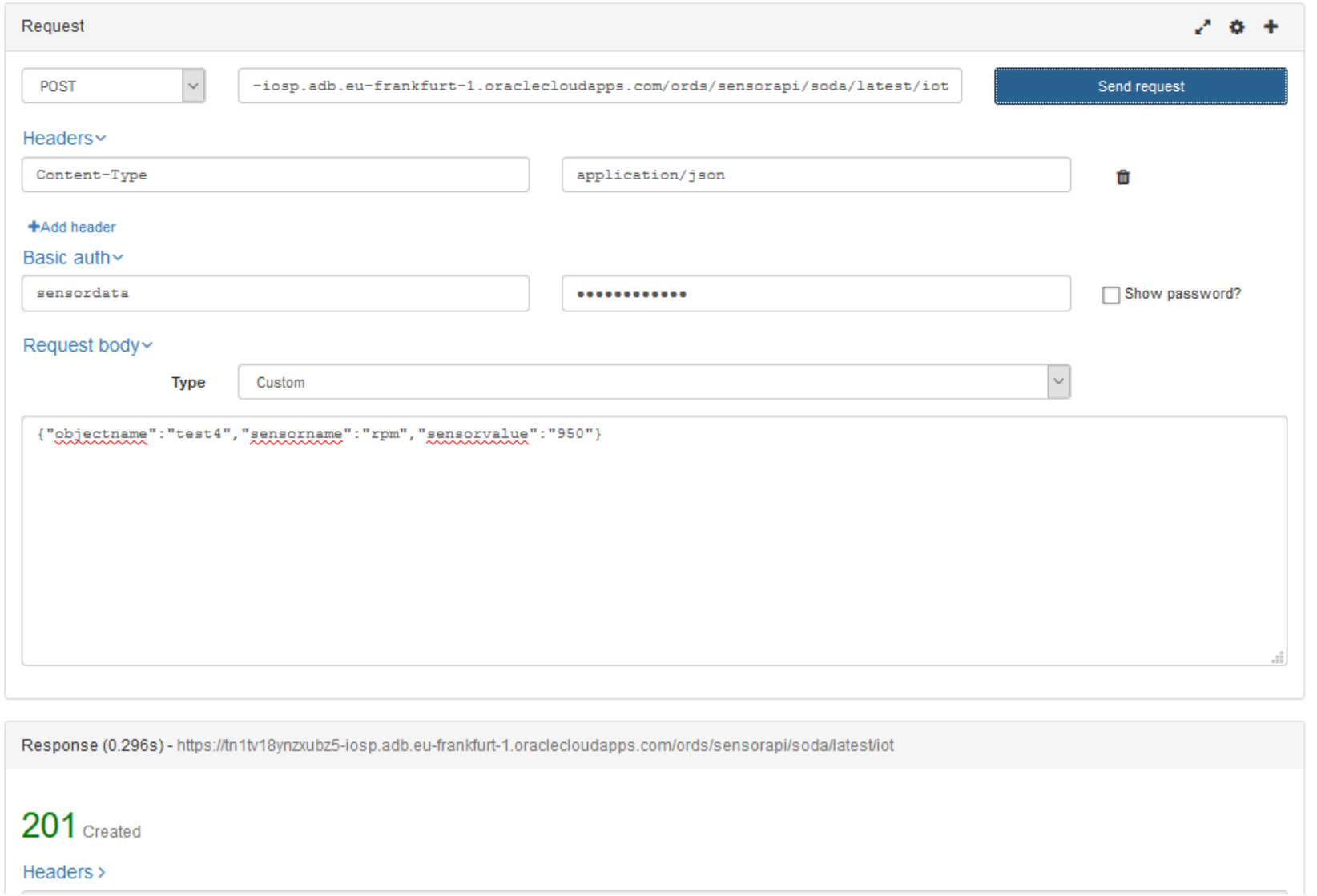
Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History | Data Loading

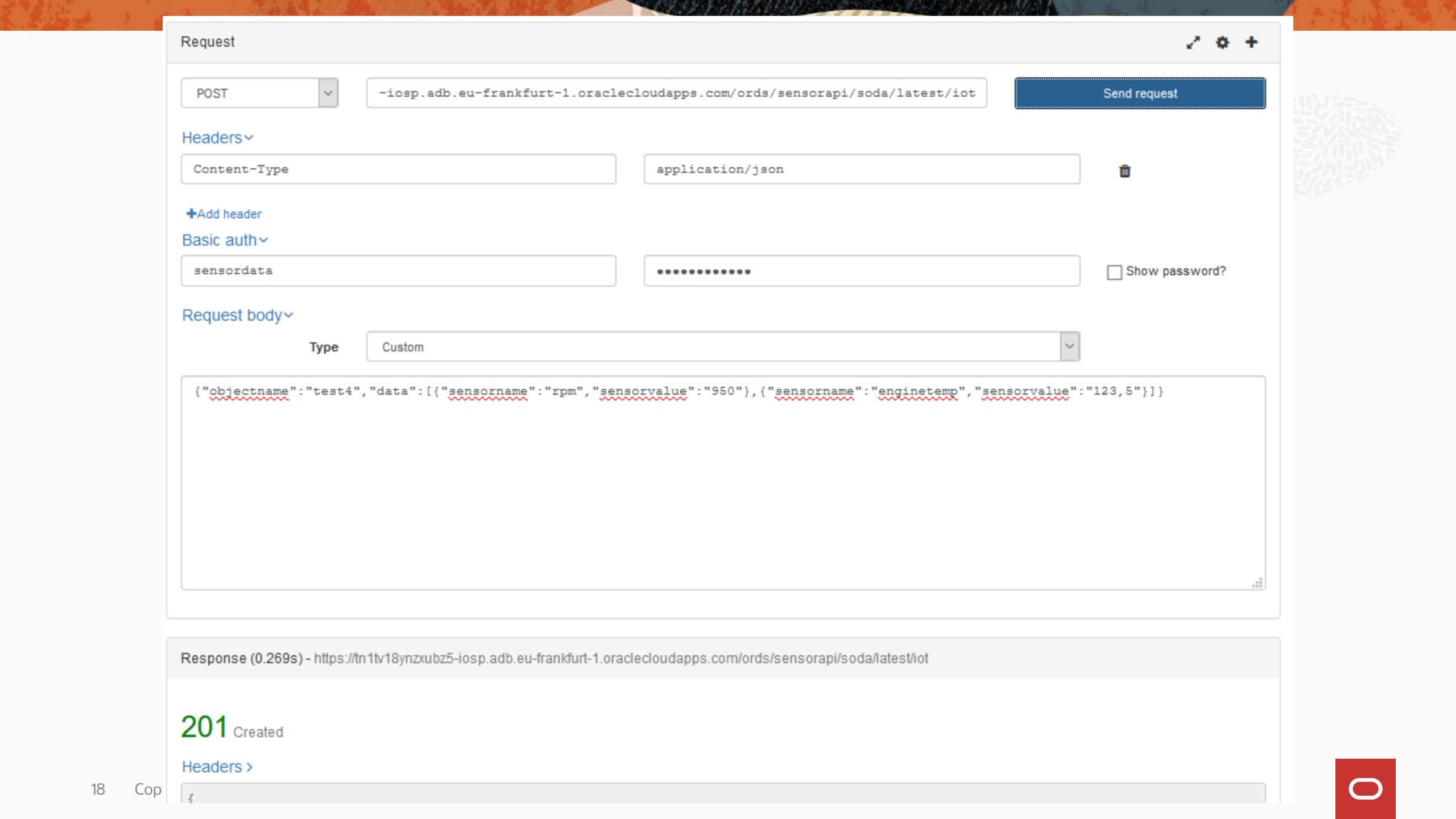
```
PL/SQL procedure successfully completed.

Elapsed: 00:00:00.015
```

https://tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensordata/_sdw/?nav=application&application=soda






Request
POST
-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensorapi/soda/latest/iot
Send request
Headers
Content-Type
application/json
Add header
Basic auth
sensordata
Show password?
Request body
Type
Custom
{"objectname":"test4","data":[{"sensorname":"rpm","sensorvalue":"950"},{"sensorname":"enginetemp","sensorvalue":"123,5"}]}
Response (0.269s) - https://tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensorapi/soda/latest/iot
201 Created
Headers

Autonomous Transaction Process | Oracle Database Actions | JSON

tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensordata/_sdw/?nav=application&application=soda&page=JsonCollection%23iot

Apps | Gmail | YouTube | Maps | Oracle Cloud Ops P... | Reading list

ORACLE Database Actions | JSON

SENSORDATA

JSON Collections

Search...

iot

JSON - iot

Add Clause

1 {}

```
{
    "objectname": "test4",
    "sensorname": "rpm",
    "sensorvalue": "950"
}
```

1 0 0 | 2:27:45 PM - REST call resolved successfully.

Autonomous Transaction Process | Oracle Database Actions | SQL

tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensordata/_sdw/?nav=worksheet

Apps | Gmail | YouTube | Maps | Oracle Cloud Ops P... | Reading list

ORACLE Database Actions | SQL

SENSORDATA

Navigator | Worksheets

SENSORDATA

Tables

Search...

- IOT
- SENSORS

[Worksheet]*

```
1  select id, created_on, json_serialize(json_document) as json_data from iot;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History | Data Loading

Download | Execution time: 0.004 seconds

	id	created_on	json_data
1	585852C0FF0B4585	2021-05-10T14:27:1	{"objectname":"test4","sensorname":"rpm","sensorvalue":"950"}
2	584907CD3C6B48B	2021-05-10T14:32:5	{"objectname":"test4","data":[{"sensorname":"rpm","sensorvalue":"950"},{"sensorname":"enginetemp","s

1 | 0 | 0 | 2:33:28 PM - 2 rows total

Autonomous Transaction Process | Oracle Database Actions | SQL

tn1tv18ynzxubz5-iosp.adb.eu-frankfurt-1.oraclecloudapps.com/ords/sensordata/_sdw/?nav=worksheet

Apps | Gmail | YouTube | Maps | Oracle Cloud Ops P... | Reading list

ORACLE Database Actions | SQL

SENSORDATA

Navigator | Worksheets

SENSORDATA

Tables

Search...

- IOT
- SENSORS

[Worksheet]*

```
1  select id, created_on, json_serialize(json_document) as json_data from iot;
```

Query Result | Script Output | DBMS Output | Explain Plan | Autotrace | SQL History | Data Loading

Download | Execution time: 0.007 seconds

	id	created_on	json_data
1	585852C0FF0B4585	2021-05-10T14:27:1	{"objectname":"test4","sensorname":"rpm","sensorvalue":"950"}

1 0 0 | 2:31:07 PM - 1 rows total