

Raptor SERVER API

Basic Implementation Tutorial

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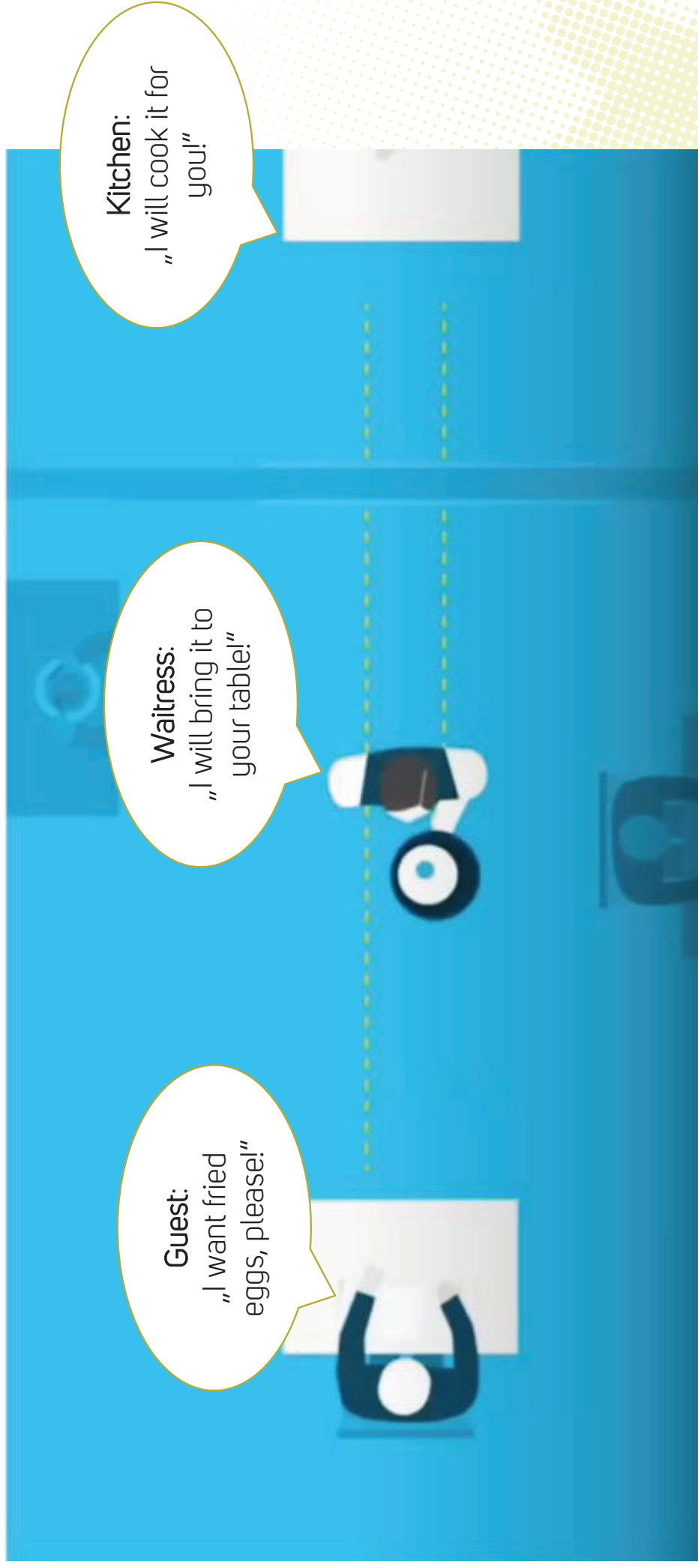
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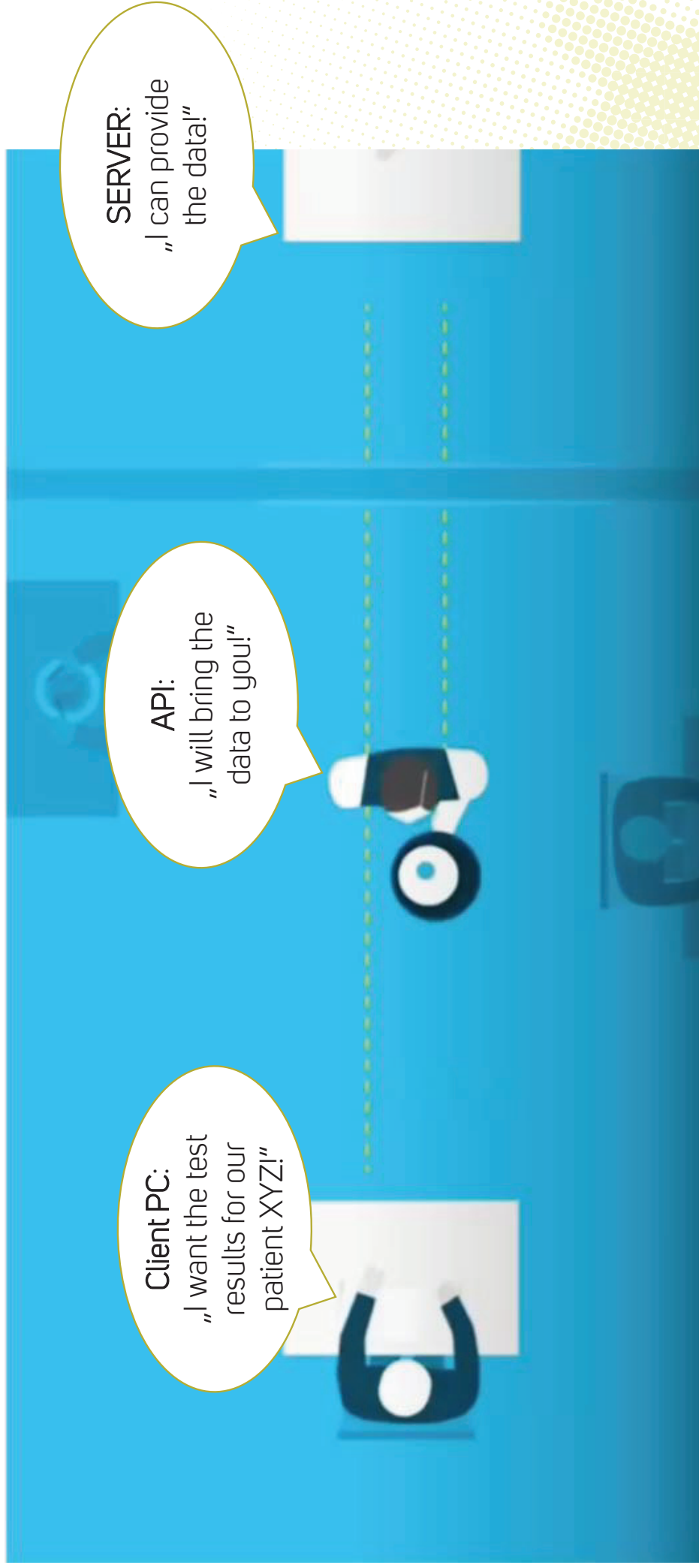
WHAT EXACTLY IS AN API?

- Application Programming Interface
- „Contract“ between two pieces of software
- Consists of structured requests and responses

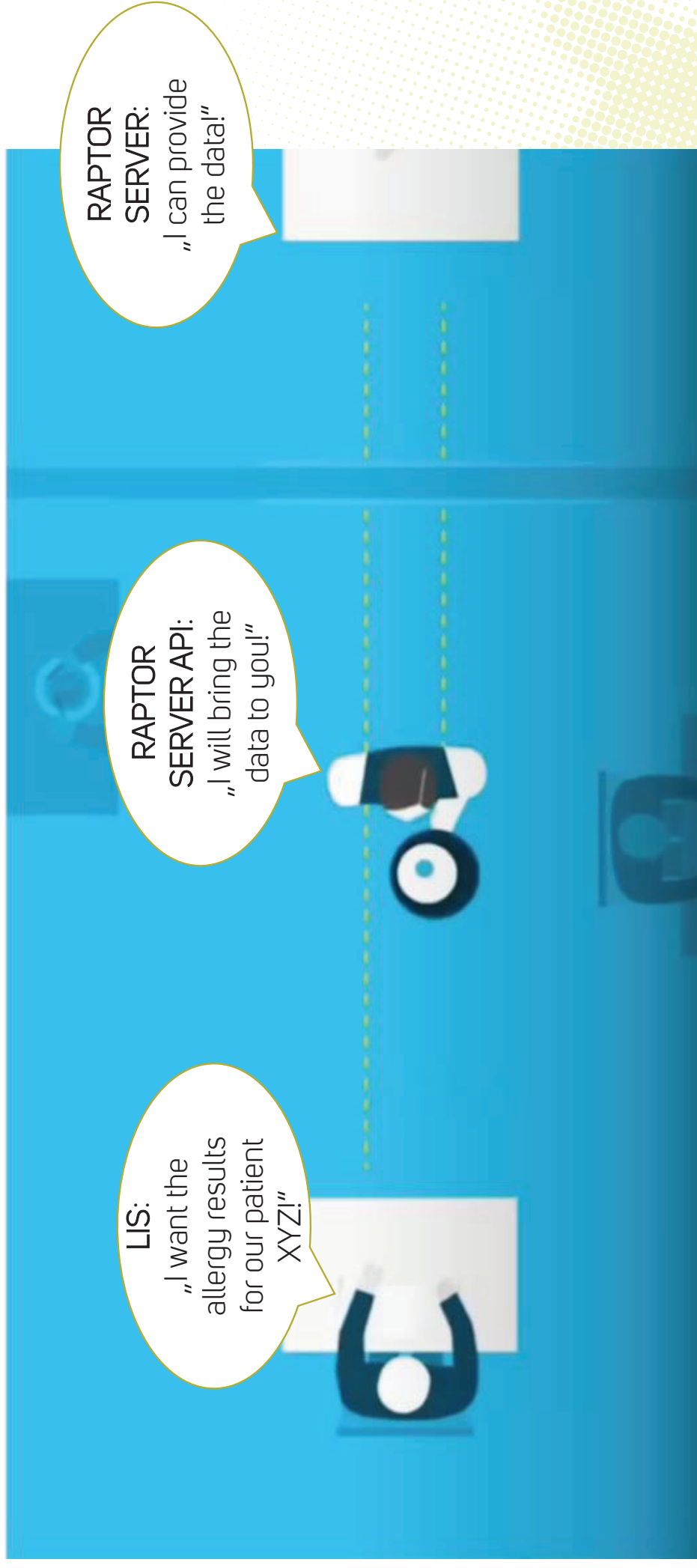
IMAGINE A RESTAURANT ...



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IMAGINE A RESTAURANT ...



THE DATA



Data exists in rows and columns, organized in tables in a database

Database in Raptor SERVER is Microsoft SQL Server

SQL Server runs in Azure Cloud



Ergebnisse		Meldungen								
	Id	TenantId	CameraName	CameraSerial	BarcodeOffsetX	BarcodeOffsetY	BarcodeWidth	BarcodeHeight	BarcodeExposure	ArrayOffset
1	EAE9A761-BA88-4BA6-197D-08D63F2464E7	226B6196-82A9-4939-B533-8DB5B55F4F10	Basler daA1280-54um (22563726)	22563726	0	200	500	660	3000	418
2	27AE85CA-1A2B-4A89-D0F5-08D642FFA6E1	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	440
3	7550A114-146B-47FD-D0F6-08D642FFA6E1	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	440
4	3732DDCD-637A-42C9-7243-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	440
5	935E1FB6-0FB5-463A-7247-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424
6	602F6060-A2B9-4E73-7248-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424
7	69AA38E0-E77D-4AC9-7249-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424
8	81119D5C-890A-4074-724A-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424
9	A9947074-6909-43E9-724B-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424
10	4CFD7984-7023-4CA8-724C-08D655F37E96	BA758E7C-366A-4DBA-0046-08D61EF658D9	Basler daA1280-54um (22124138)	22124138	0	200	500	660	3000	424

WHAT KIND API IS USED IN RAPTOR SERVER?

- So called „REST API“
- Common standard today
- Relies on the client-server protocol HTTP
- Note that the protocol is secured TLS/SSL (HTTPS), so the communication from the client PC is through the outgoing port 443
- Can be used by any programming language

API METHODS TO FOR SEND/RECEIVE DATA



HTTP POST: For sending data to the server

HTTP GET: For retrieving data from the server

HTTP DELETE: For deleting data on the server

Note, that the API does not allow for sending „orders“ from your LIS to the MAX device. It only handles data which already exists on the SERVER.

Who can use these methods?

- Any program (like LIS) who is authorized to communicate with the server API
- authorization takes place via the „API-key“, generated on the Raptor SERVER GUI (expires after 2 years!)

WHAT IS AN „API ENDPOINT“ ?

Basically, it is just the URL/URI in the network where data can be accessed (like dialing a phone number)

Example:

„I want to get all measurements my lab has performed in Raptor SERVER“

→ You go to the endpoint: <https://api.raptor-server.com/measurements>

You send a GET request to this endpoint and include the API key in your request's header

You will receive a response code („200 ok“) and the results in so-called json format (pure text file)

EXAMPLE

GET request (via
command line)

Curl

```
curl -X GET "https://api.allergy-explorer.com/measurements" -H "accept: text/plain" -H "API-Key: 8f6HkkE03HAXWZsw7qH2DncI3cyQ0MXPKfCTtUfPRw4dX4hcxE"
```

Request URL

```
https://api.raptor-server.com/measurements
```

Server response

Code

Details

Response Code

Endpoint

200

Response body

```
{
  "total_count": 24,
  "approved_count": 13,
  "measurements": [
    {
      "id": "2c77630a-0322-4369-7602-08d7b3808737",
      "barcode": "02AA0018",
      "sampling_date": null,
      "assay_date": "2020-02-17T00:00:00",
      "processed_date": "2020-02-17T11:41:47.3637489",
      "analyzed_date": "2020-02-17T11:47:08.4080574",
      "approved_date": "2020-06-17T07:07:38.8509801",
      "sample_code": "34567",
      "patient_birthdate": null,
      "patient_code": null,
      "patient_name": null,
      "sample_doctorinfo": null,
      "sample_info": null,
      "qc": "Ok"
    },
    {
      "id": "05934ae0-460b-4521-7611-08d7b3808737",
      "barcode": "02AA0023",
      "sampling_date": null,
      "assay_date": "2020-02-17T00:00:00",
      "processed_date": "2020-02-17T12:20:12.0630501",
      "analyzed_date": "2020-02-17T12:20:16.1354276",
      "approved_date": "2020-06-17T07:07:29.2564453",
      "sample_code": "12345",

```

HTTP response in
Json format

AVAILABLE FUNCTIONS - SWAGGER



- Modern APIs are fully documented in a standardized fashion with a so called „Swagger“ page
- The swagger presents the structure of the API in a way that machines or humans can read and try out functions
- Open a browser and go to:
<https://api.raptor-server.com/swagger>

 **Swagger**
Sponsored by SMARTBEAR

Raptor API **v1.2.3.68** **OAS3**
[/swagger/v1.2.3.68/swagger.json](#)

Use this API to access and manipulate Raptor data. For most API call you'll need a valid API key, and you'll need to supply this API key either with a "key" query parameter, or a "API-Key" HTTP header parameter for all of your requests to the API. API keys can be created in Raptor by tenant administrators.

Select a definition **Raptor API v1.2.3.68** 

TRY IT OUT



You can simulate the communication between the LIS and the Raptor API directly on the Swagger page

<https://api.raptor-server.com/swagger>

You will need the API key for the tenant (ask the laboratory to create the API key on the Raptor GUI), or you can request a key for a dummy tenant from MADx which can be used for testing

THE MOST USED ENDPOINTS

For the communication with a LIS, you will typically use the following endpoints:

GET **/measurements** Returns a list of all measurements for the current tenant.

GET **/measurement/{id}** Returns information about a specific measurement and includes the associated allergens in a flat list.

GET **/measurement/{id}/report** Downloads the PDF report for a specific measurement.

POST **/measurement/{id}/report** Downloads the PDF report for a specific measurement. Allows to specify additional parameters (patient name, sample code etc.) to be included in the PDF report. This additional information will be discarded after the PDF generation. This enables GDPR-friendly scenarios where RAPTOR-SERVER does not have access to this additional patient information, but still allows for generation of specific reports.

PUT **/measurement/{id}** Allows setting the metadata of a NewMeasurement.

Note, that the API does not allow for sending „orders“ from your LIS to the MAX device. It only handles data which already exists on the SERVER.

STEP 1: AUTHORIZATION

On the Swagger page, click on „Authorize“ and paste the API key into the „Value“ field. Click on „Authorize“.

Raptor API v1.2.3.68 OAS3
[/swagger/v1.2.3.68/swagger.json](#)

Use this API to access and manipulate Raptor data. For most API call you'll need a valid API key, and you'll need to supply this API key either with a "key" query parameter, or a "API-Key" HTTP header parameter for all of your requests to the API. API keys can be created *in Raptor* by tenant administrators.

Contact Hannes Sachsenhofer

Available authorizations

apiKey (apiKey)

Name: API-Key

In: header

Value:

Authorize

Close

Authorize

STEP 2: RETRIEVE A LIST OF MEASUREMENTS

- Go down to „MeasurementsTenant“ and click on the blue „GET“ button in the endpoint „/measurements“.
- Click on „Try it out“
- Set the „status“ and apply filters as desired
- Click on „Execute“
- Check that the http response code is „200“
- Find the results (list of measurements) in Json format in the Response body window
- Copy the „id“ (this is a long, generic ID, not the sample code or QR code !)
from the measurement from which you want to get the report

```
"measurements": [
{
  "id": "2c77630a-0322-4369-7602-08d7b3808737",
  "barcode": "02AAB018",
  "sampling_date": null,
  "assay_date": "2020-02-17T00:00:00",
  "processed_date": "2020-02-17T11:41:47.3637489",
  "analyzed_date": "2020-02-17T11:47:08.4080574",
  "approved_date": "2020-06-17T07:07:38.8509801",
  "sample_code": "34567",
  "patient_birthdate": null,
  "patient_code": null,
  "patient_name": null,
  "sample_doctorinfo": null,
  "sample_info": null,
  "qc": "Ok"
},
{
  "id": "2c77630a-0322-4369-7602-08d7b3808737",
  "barcode": "02AAB018",
  "sampling_date": null,
  "assay_date": "2020-02-17T00:00:00",
  "processed_date": "2020-02-17T11:41:47.3637489",
  "analyzed_date": "2020-02-17T11:47:08.4080574",
  "approved_date": "2020-06-17T07:07:38.8509801",
  "sample_code": "34567",
  "patient_birthdate": null,
  "patient_code": null,
  "patient_name": null,
  "sample_doctorinfo": null,
  "sample_info": null,
  "qc": "Ok"
}
]
```

THE „ID“

- The „id“ property is generated automatically in Raptor server and is a unique key
- The link between RAPTOR SERVER and the LIS is usually be established with the „sample_code“ property. This is the barcode of the sample and will be scanned automatically in the MAX 45k analyzer
- The „barcode“ in the API refers to the QR code of the test cartridge

```
{  
  "measurements": [  
    {  
      "id": "2c77630a-0322-4369-7602-08d7b3808737",  
      "barcode": "02AAB018",  
      "sampling_date": null,  
      "assay_date": "2020-02-17T00:00:00",  
      "processed_date": "2020-02-17T11:41:47.3637489",  
      "analyzed_date": "2020-02-17T11:47:08.4080574",  
      "approved_date": "2020-06-17T07:07:38.8509801",  
      "sample_code": "34567",  
      "patient_birthdate": null,  
      "patient_code": null,  
      "patient_name": null,  
      "sample_doctorinfo": null,  
      "sample_info": null,  
      "qc": "Ok"  
    }  
  ]  
}
```

STEP 3: RETRIEVING THE RESULTS

- Go to „MeasurementTenant“ (without the „s“) and click on the blue „GET“ button in the endpoint „/measurement/{id}“
- Click on „Try it out“
- Paste (CTRL+V) the „id“ from the measurement which you have copied from the list before
- Click on „Execute“
- Check that the http response code is „200“
- Find the results (results for all allergens) in Json format in the Response body window

HOW CAN THE LAB COPY THE RESULTS FROM SWAGGER INTO THEIR LIS?



Short answer: They don't!

The Swagger website is for documentation and small tests only

In routine, all http requests to the API are performed fully automatically by a program which is part of the LIS

→ The lab needs to develop software which makes the API requests and pushes the results into the LIS database

DOWNLOADING THE PDF REPORT WITHOUT PATIENT DATA ON THE SERVER

It is a common use case, that labs do not enter patient data on the Server (through the GUI) due to data protection. Still, they would like to have the data with the results in the downloaded report pdf. This is possible by sending the data with the API request to generate the report. The data will not reach the server database.

- Go to „MeasurementTenant“ and click on the green POST button at the endpoint „/measurement/{id}/report“
- Click on „Try it out“
- Paste the „id“ into the id-field and enter the desired patient data into the request body, like name, date of birth etc., replacing the default „string“ value.
- Click on „Execute“
- Check that the http response code is „200“ and click on „Download file“ to get the PDF report
- The patient data is NOT saved in the RAPTOR SERVER database!