Clinician Scheduler Documentation

Release 1.0

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The clinician scheduler allows you to automatically generate and publish schedules that satisfy common constraints in an on-call system, while taking into account the preferences of clinicians.

CHAPTER

ONE

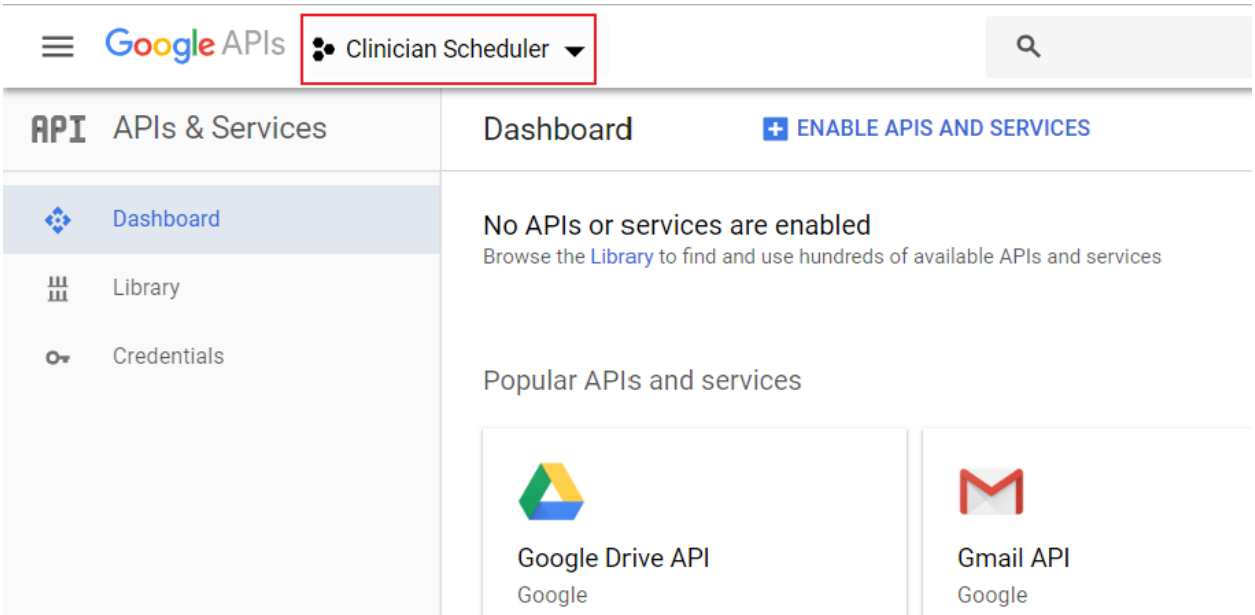
SETUP

1.1 Generating Google API credentials

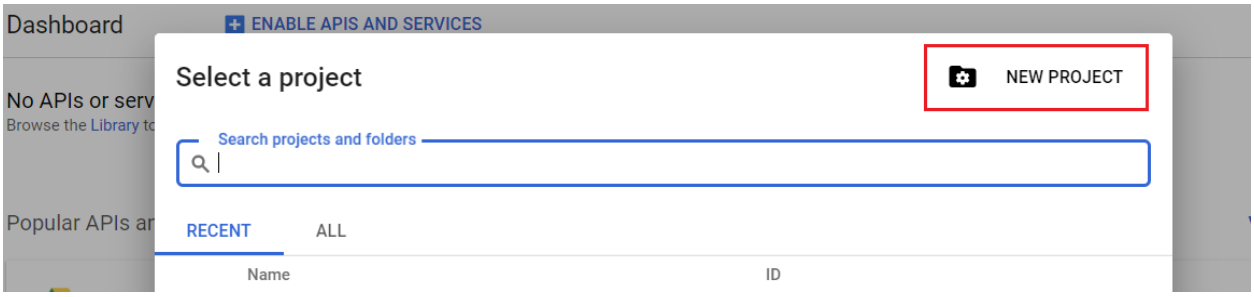
Note: This process should only be done the very first time you are running the program. If you have previously generated a credential file using this process you should be able to re-use it. Just make sure that the credential file is placed in the same folder as the executable (`scheduler.exe`).

The application uses Google calendar for retrieving clinician time-off requests and long weekend information, as well as uploading the generated schedule to the calendar. These operations require the use of Google API credentials, which can be generated as follows.

1. Sign into https://console.developers.google.com.
2. Click on the project selector at the top left of the page.



3. Click on *New Project*.



4. Enter "Clinician Scheduler" as the *Project Name* and click *Create*.

5. Now you should see the dashboard for the Clinician Scheduler project. You will need to enable the Google calendar API. Click on *Enable APIs and Services*.

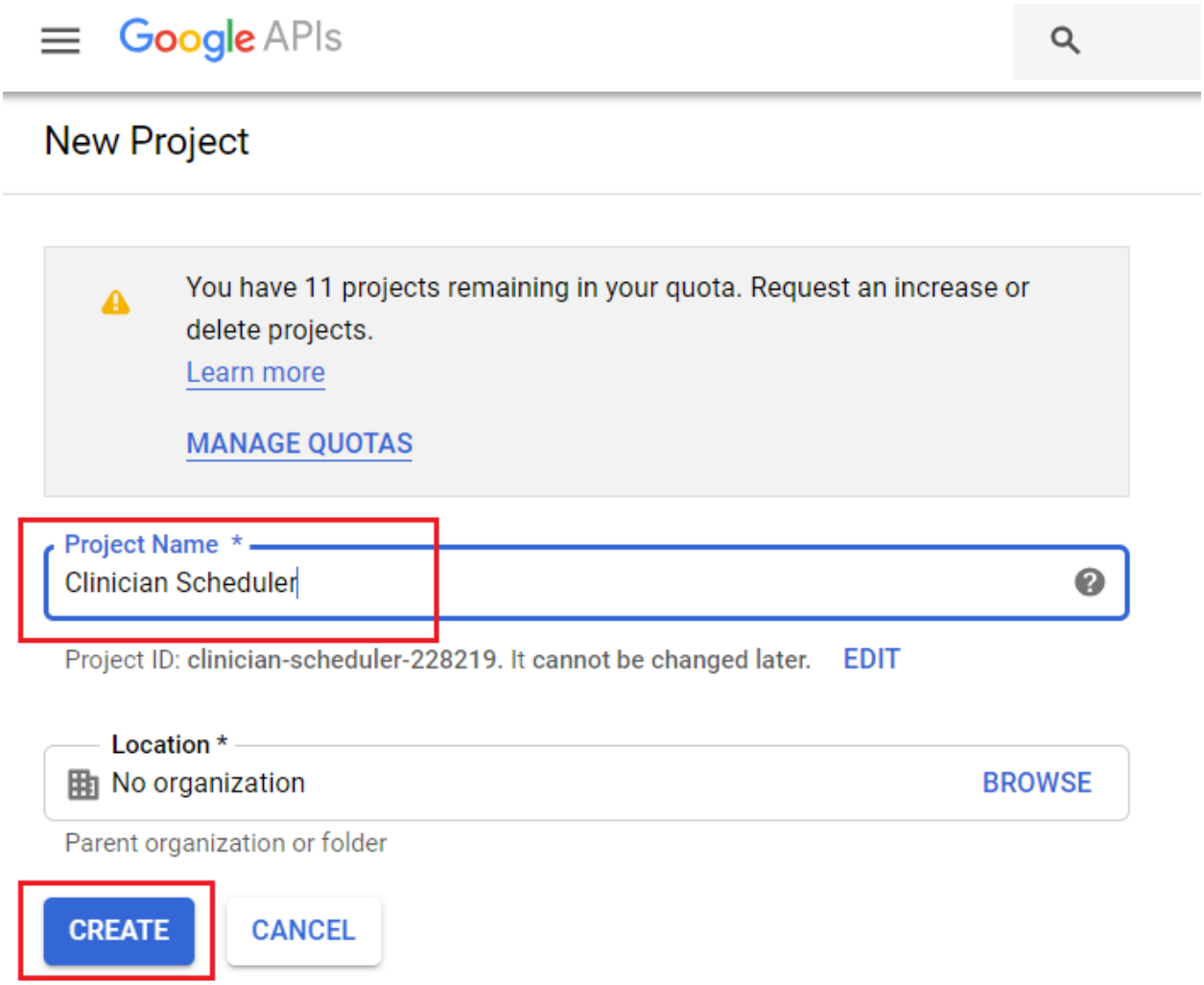
6. Search for "Google calendar API" using the search bar, and select it.

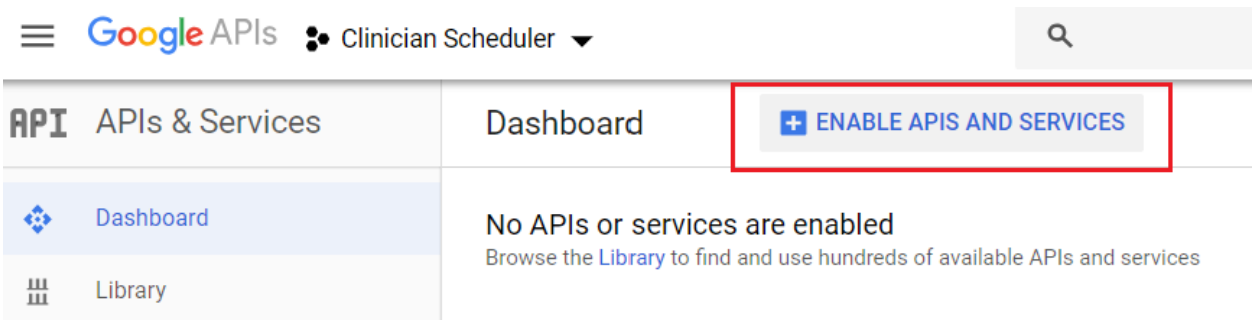
7. Click *Enable*.

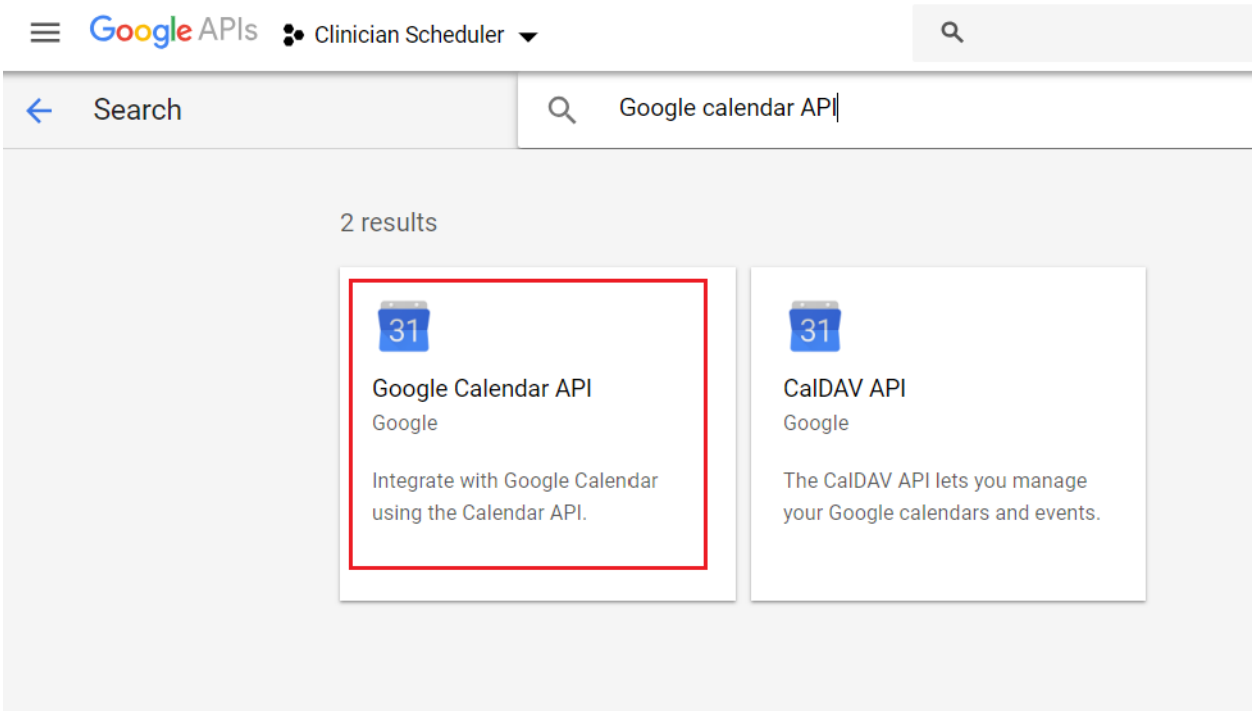
8. Now you should see the overview page for the Google calendar API. To generate the credentials, click *Create credentials*.

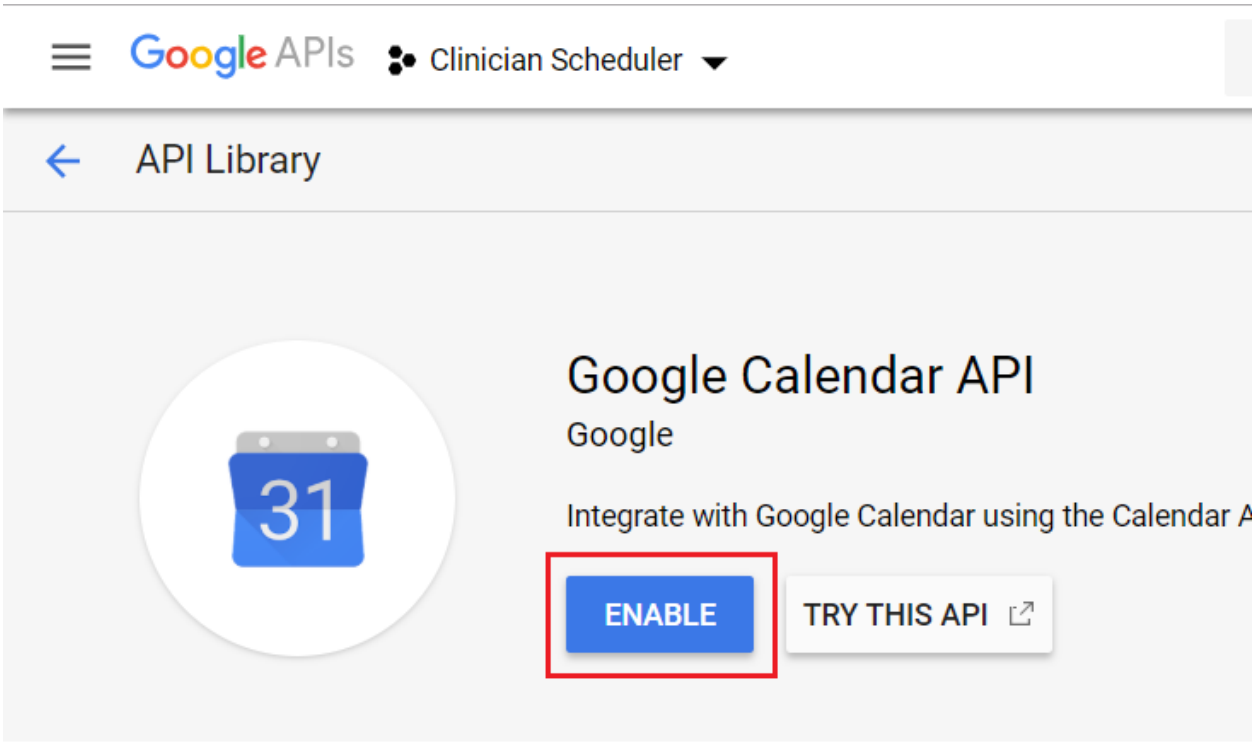
9. On the credentials form, choose "Google Calendar API" for *Which API are you using?*, then "Other UI (e.g. Windows, CLI tool)" for *Where will you be calling the API from?* and "User data" for *What data will you be accessing?*. Then click on *What credentials do I need?*.

10. Enter "Client" for *Name* and click on *Create OAuth client ID*.

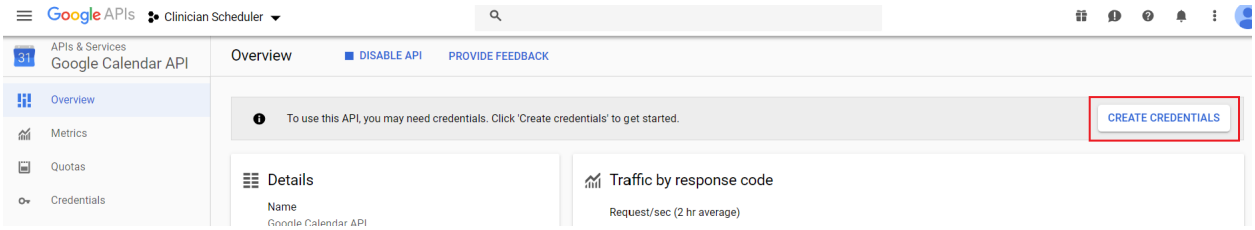

Google APIs
New Project
You have 11 projects remaining in your quota. Request an increase or delete projects.
Learn more
MANAGE QUOTAS
Project Name *
Clinician Scheduler
Project ID: clinician-scheduler-228219. It cannot be changed later.
EDIT
Location *
No organization
BROWSE
Parent organization or folder
CREATE
CANCEL

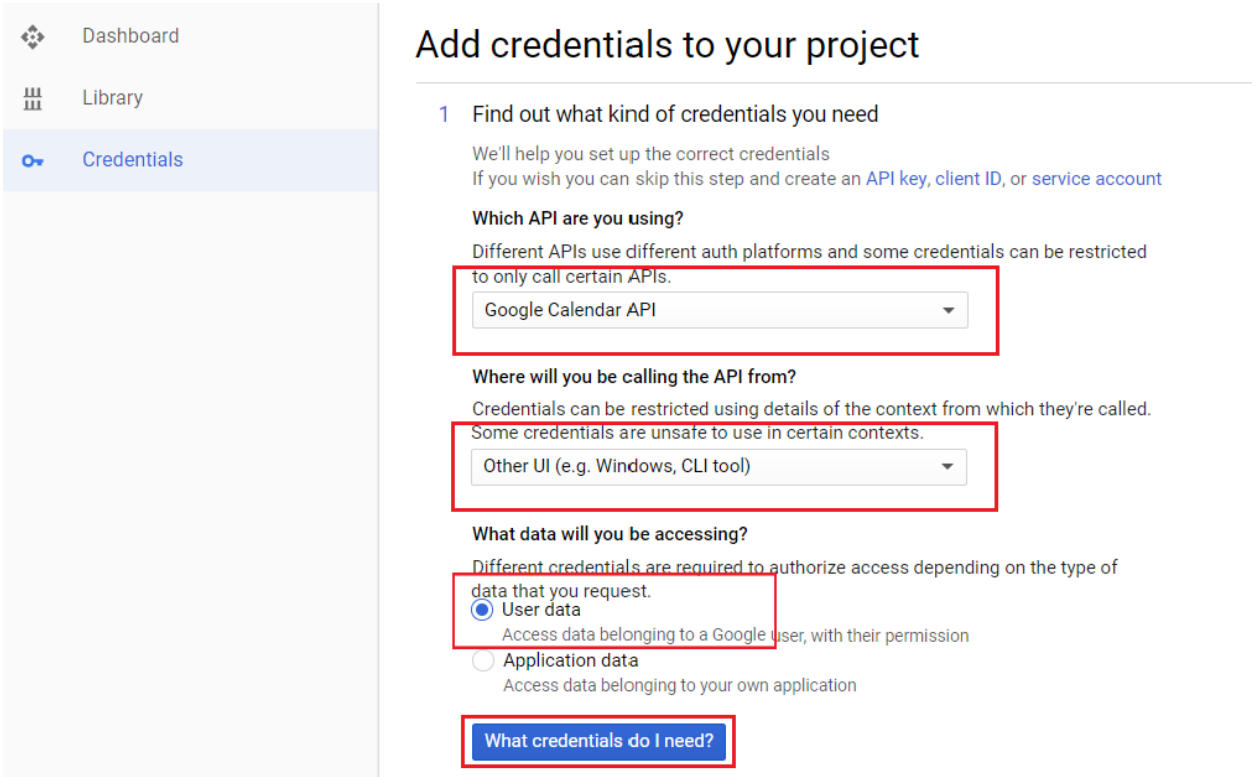

Google APIs
Clinician Scheduler
APIs & Services
Dashboard
ENABLE APIS AND SERVICES
Dashboard
Library
No APIs or services are enabled
Browse the Library to find and use hundreds of available APIs and services

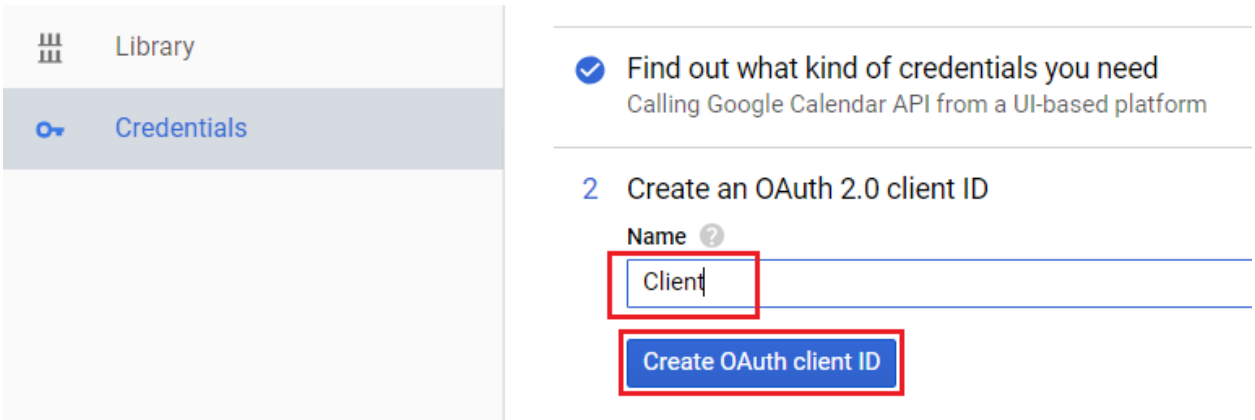




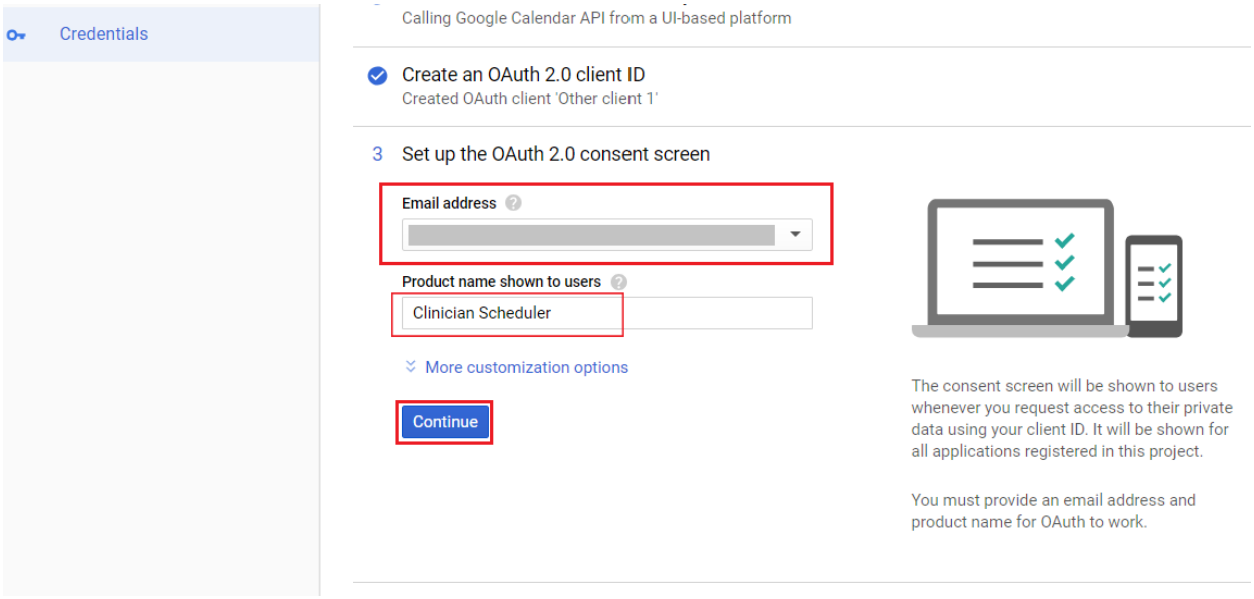
Type Overview


Google APIs
Clinician Scheduler
APIs & Services
Google Calendar API
Overview
DISABLE API
PROVIDE FEEDBACK
Overview
Metrics
Quotas
Credentials
To use this API, you may need credentials. Click 'Create credentials' to get started.
CREATE CREDENTIALS
Details
Name
Traffic by response code
Request/sec (2 hr average)

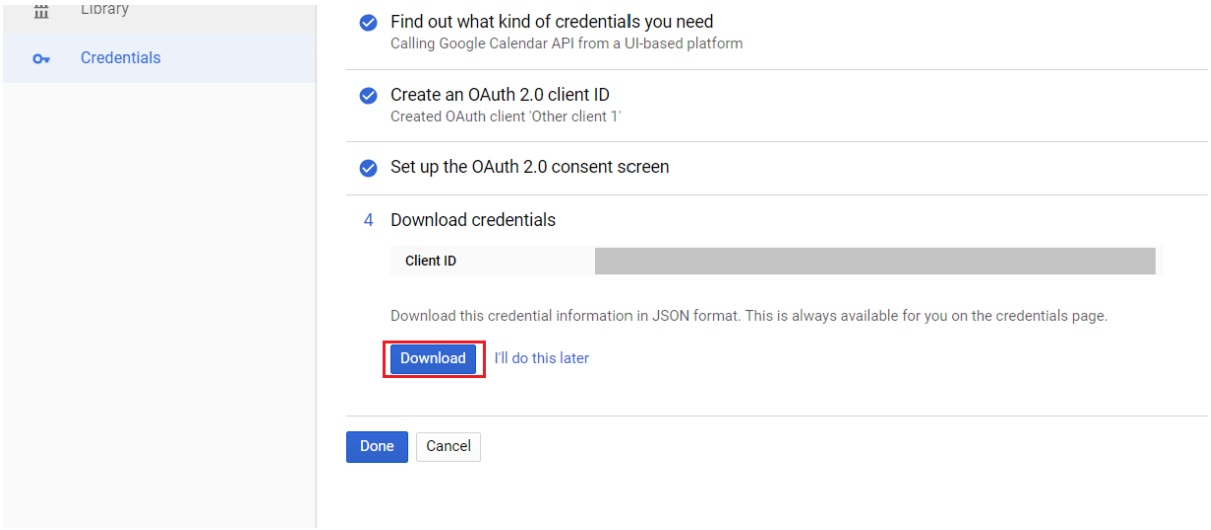

Dashboard
Library
Credentials
Add credentials to your project
1 Find out what kind of credentials you need
We'll help you set up the correct credentials
If you wish you can skip this step and create an API key, client ID, or service account
Which API are you using?
Different APIs use different auth platforms and some credentials can be restricted to only call certain APIs.
Google Calendar API
Where will you be calling the API from?
Credentials can be restricted using details of the context from which they're called.
Some credentials are unsafe to use in certain contexts.
Other UI (e.g. Windows, CLI tool)
What data will you be accessing?
Different credentials are required to authorize access depending on the type of data that you request.
User data
Access data belonging to a Google user, with their permission
Application data
Access data belonging to your own application
What credentials do I need?


Library
Credentials
Find out what kind of credentials you need
Calling Google Calendar API from a UI-based platform
2 Create an OAuth 2.0 client ID
Name
Client
Create OAuth client ID

11. Choose the email address associated to your account for *Email address* and enter "Clinician Scheduler" for *Product name shown to users*, then click *Continue*.



12. Your credentials are now generated! Make sure to download and save them in the same location that you unzipped the application, so that the credential file and the executable file (`scheduler.exe`) are in the same folder.



Attention: Make sure the credential file is saved as `credentials.json` (rename it, if necessary), or otherwise the application will not be able to recognize it!

1.2 Google Calendar Configuration

1.2.1 Creating a calendar

1.2.2 Adding holiday events

1.2.3 Adding clinician requests

CHAPTER

TWO

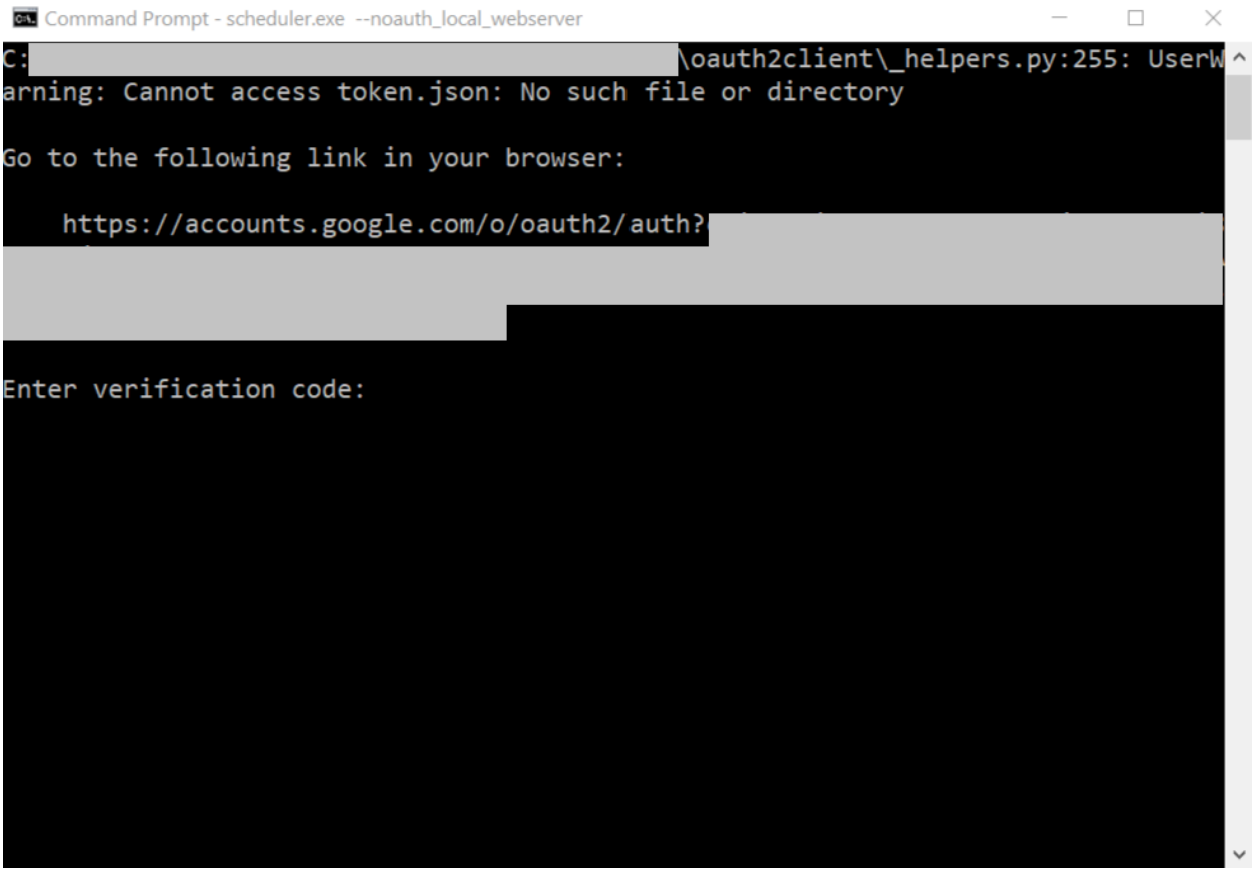
USAGE

2.1 Authentication

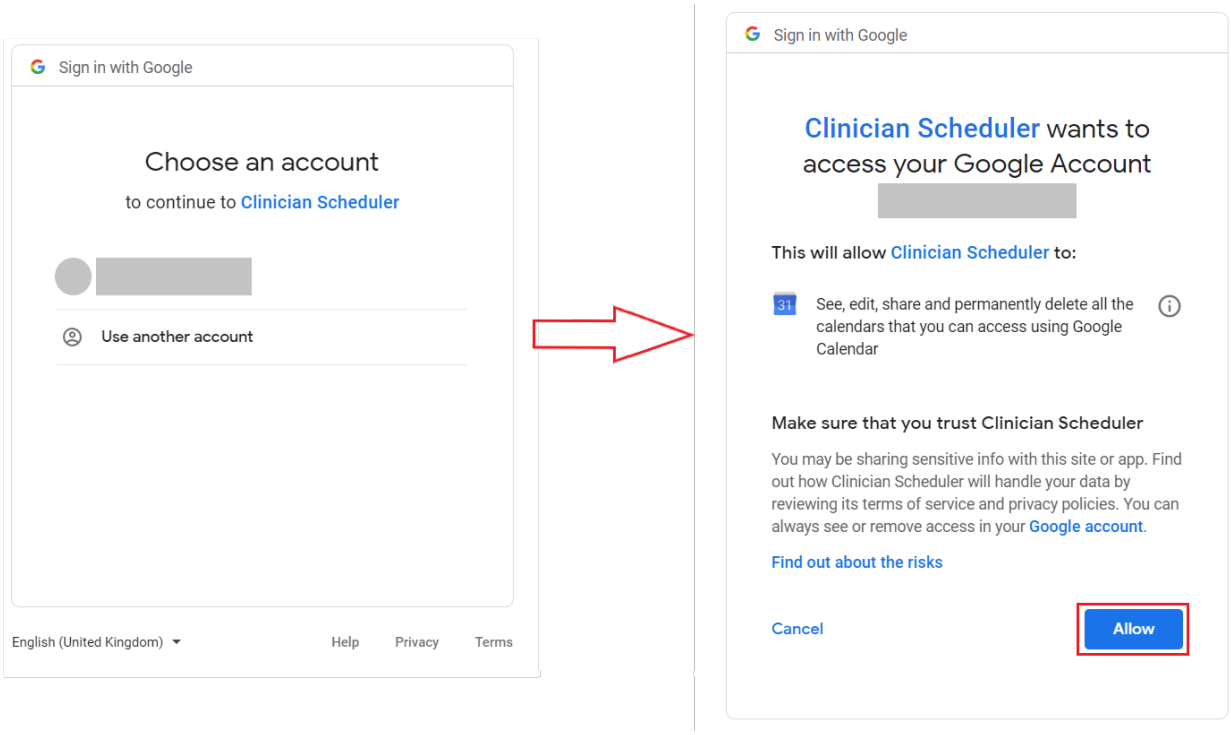
When the scheduler first makes a connection to Google calendar, it needs to create an authentication token, which will be used to simplify future connections.

This requires you to allow the scheduler application to access a calendar that you specified. You may encounter this when using any functionality that interacts with Google calendar, for example in *Generating a schedule* or in *Publishing a schedule to Google Calendar*.

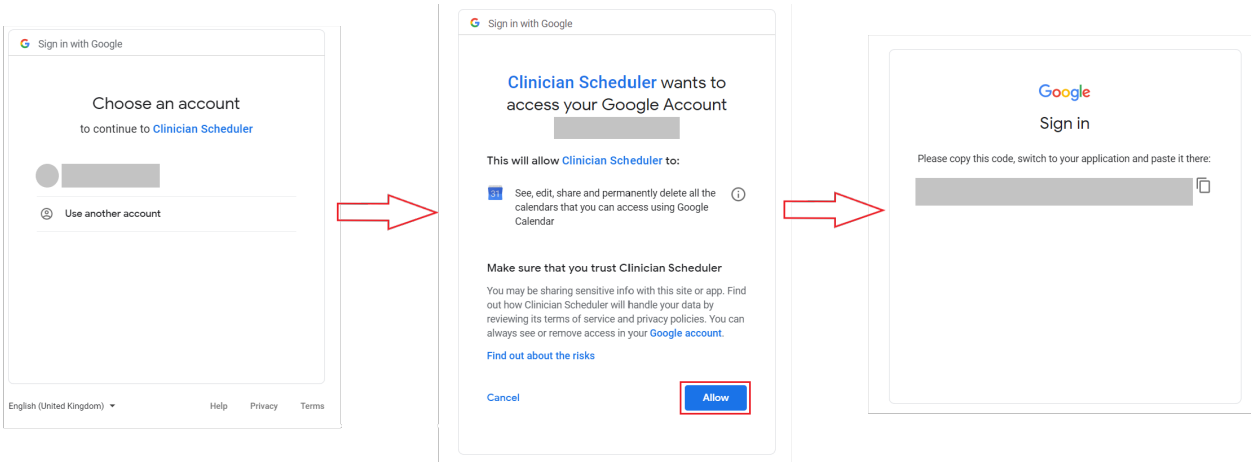
1. The scheduler should have automatically opened the access request page in a browser window, in which case you can skip to step 2. **Otherwise**, locate the command prompt for the scheduler. You should see instructions to open the access request printed on the command prompt. Follow these instructions in order to open the access request page manually.



2. Follow the instructions on the access request page in order to allow the scheduler application to read/write from/to the calendar you specified.



(Optional) If you opened the access request manually in step 1, you will receive an authentication code which needs to be pasted into the command prompt



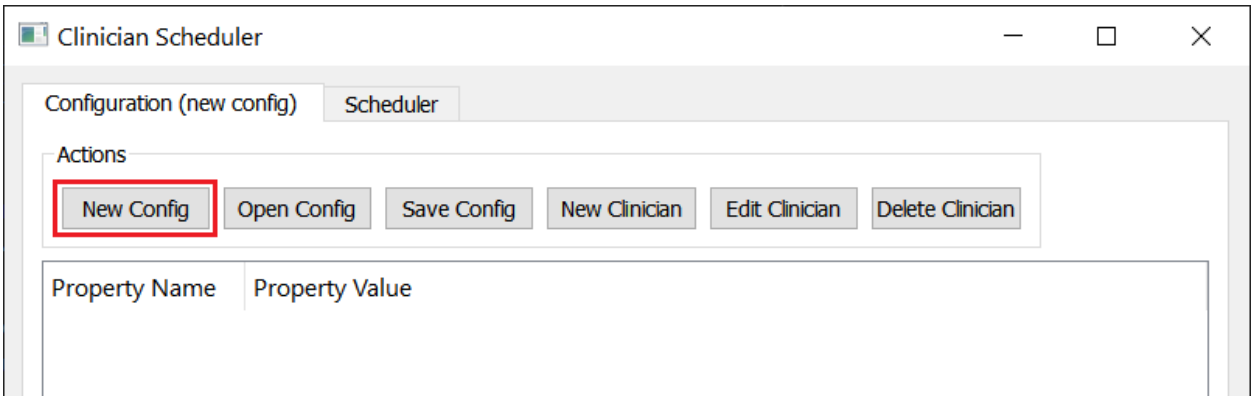
3. Once you have completed the authentication process, the scheduler will automatically resume its functionality.

2.2 Clinician Configuration

Before we can generate a schedule, we need to create a configuration file that specifies which clinicians are available, and how many weeks each clinician should fulfill.

2.2.1 Creating a new configuration file

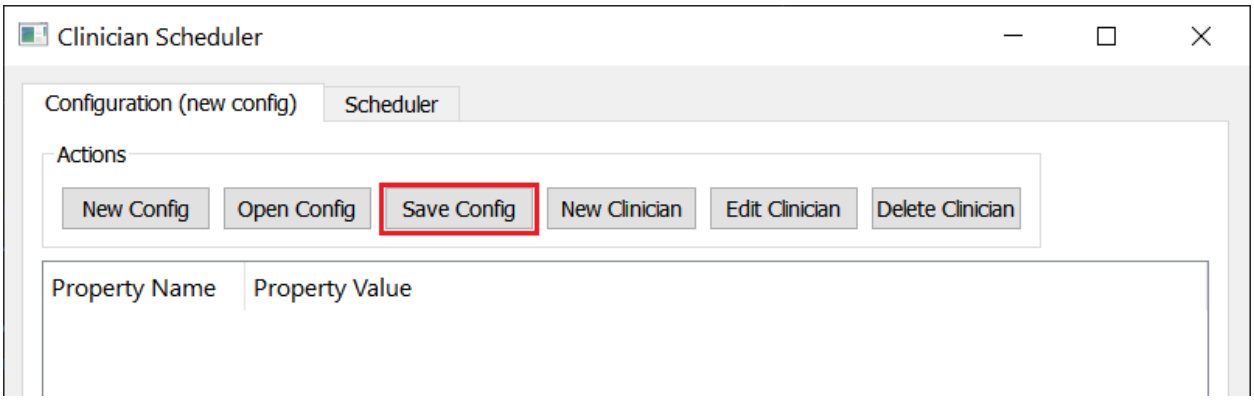
By default, you will get a blank configuration file when you launch the program. If you would like to discard the changes you have made and start a configuration file from scratch, simply click on *New Config*.



Warning: Unsaved changes to a configuration file will be discarded upon clicking *New Config*.

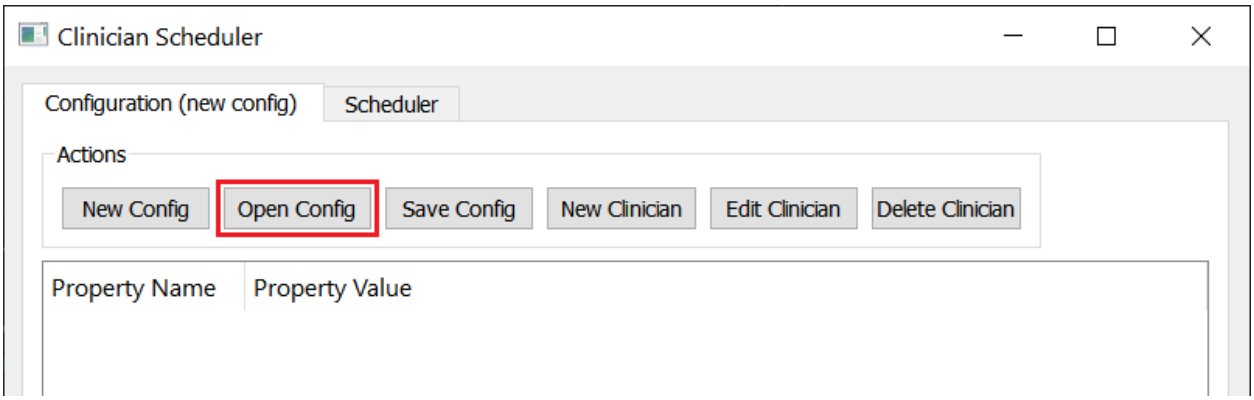
2.2.2 Saving the configuration file

When you are ready to save the configuration you created, click on *Save Config* and choose a place to save your file. Make note of the name and directory of the file so you could load it in future runs.



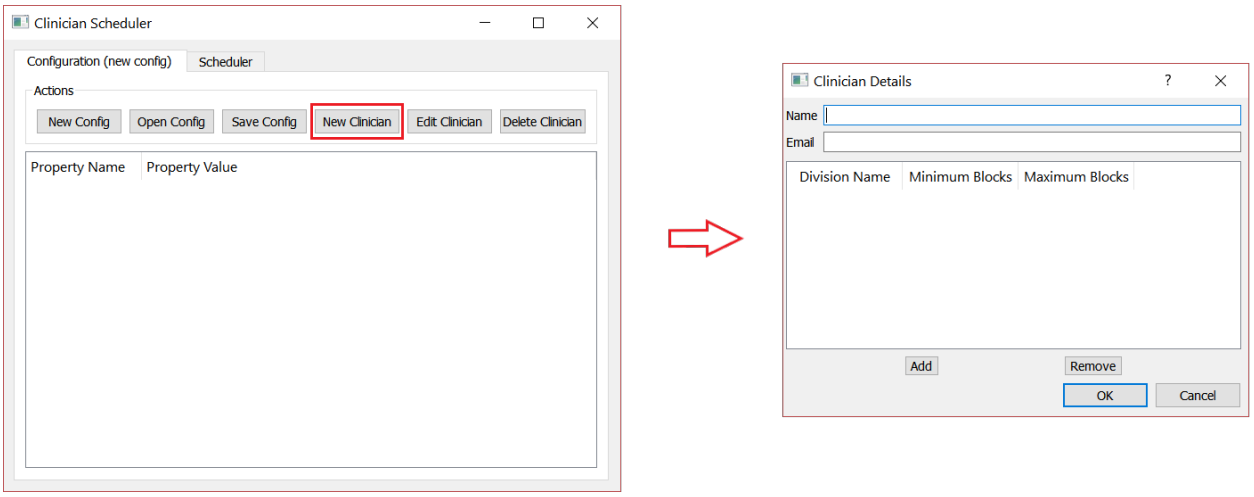
2.2.3 Loading a configuration file

If you would like to open a previously created configuration file, simply click on *Open Config*, navigate to the location of the configuration file, and select it.



2.2.4 Adding a new clinician

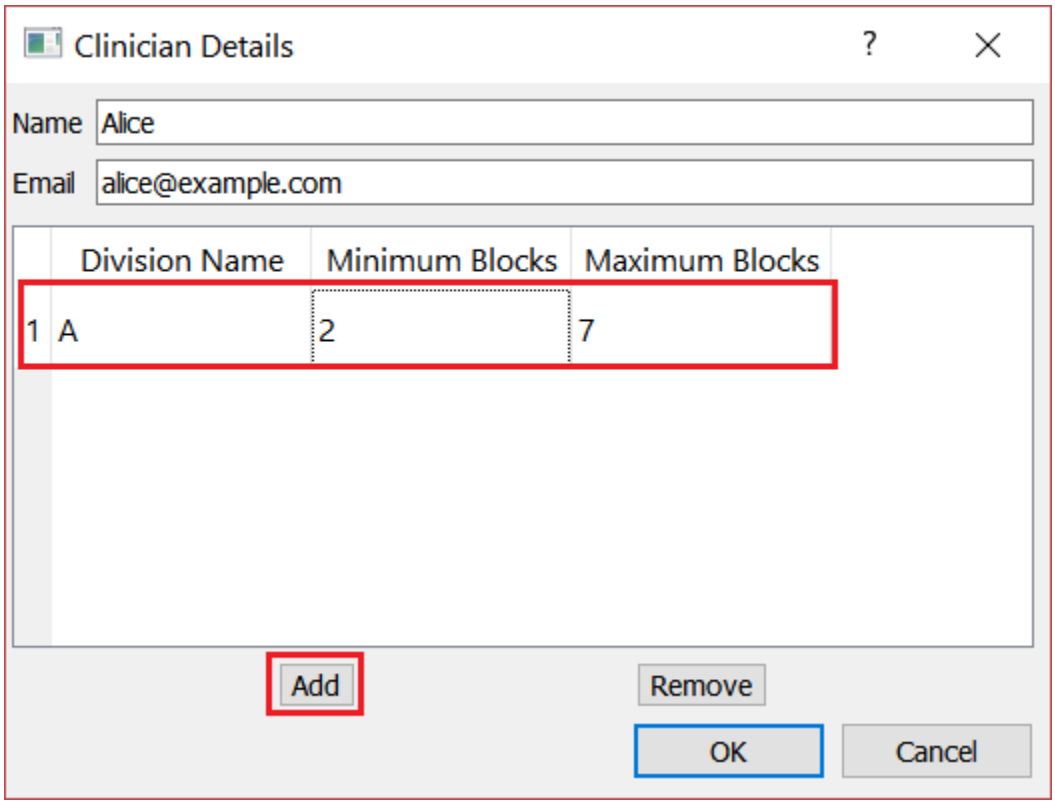
1. From the configuration tab, click *New Clinician*. You should see a form for supplying details.

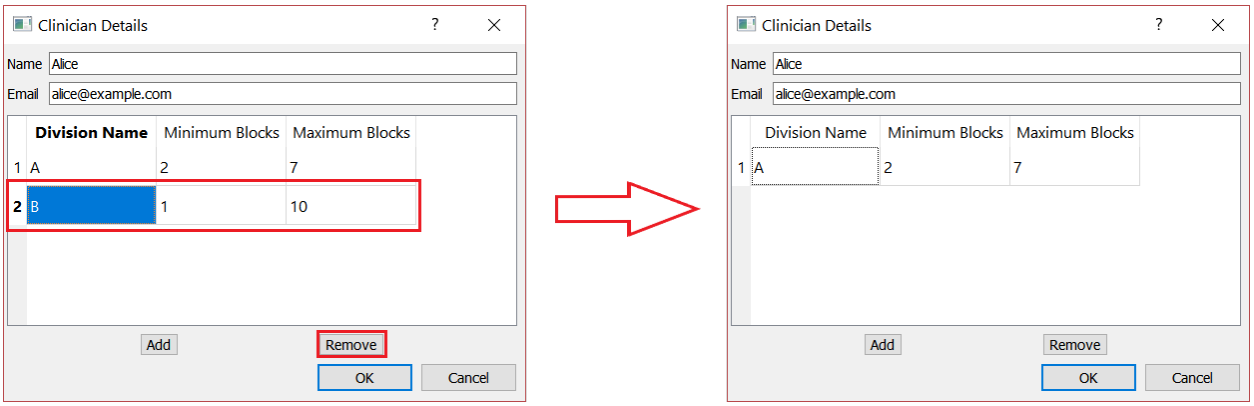


2. Fill out the name, email (optional), and divisions that the clinician will be covering. To add a division you can click on *Add* and a new row will be added to the table which you can fill out. You can set the minimum and maximum number of blocks that a clinician can work in a given division.

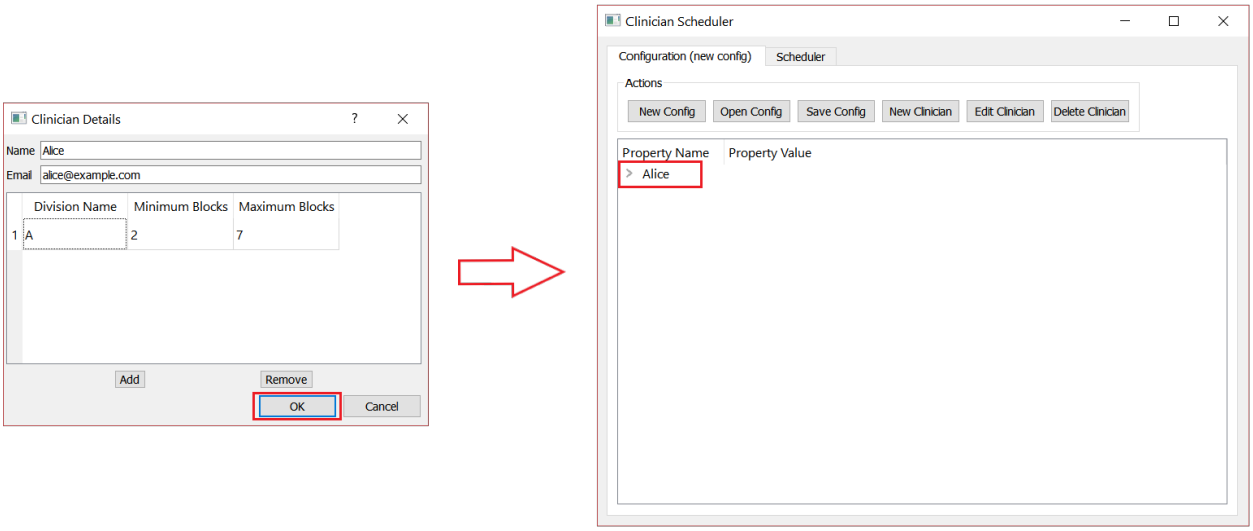
Note: A single block corresponds to two weeks.

3. To delete a row from the table, select the row and then click *Remove*.


Clinician Details
Name
Alice
Email
alice@example.com
Division Name
Minimum Blocks
Maximum Blocks
1
A
2
7
Add
Remove
OK
Cancel

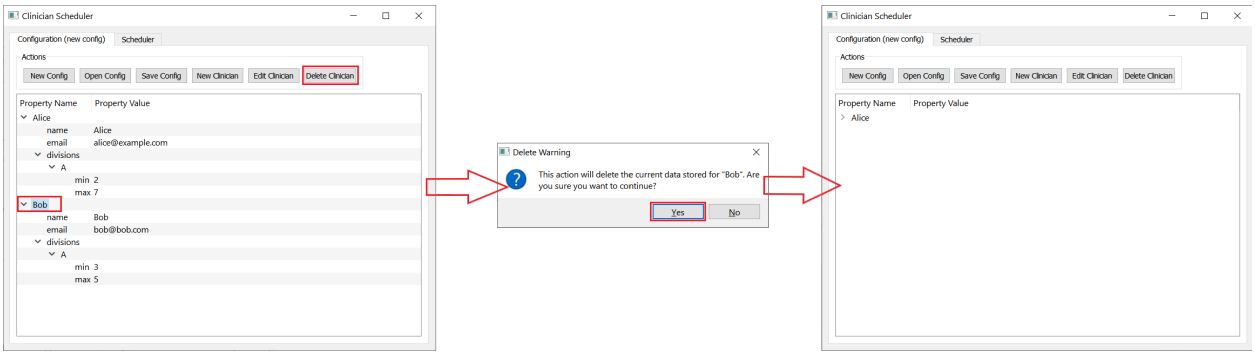

Clinician Details
Name
Alice
Email
alice@example.com
Division Name
Minimum Blocks
Maximum Blocks
1
A
2
7
2
B
1
10
Add
Remove
OK
Cancel
Clinician Details
Name
Alice
Email
alice@example.com
Division Name
Minimum Blocks
Maximum Blocks
1
A
2
7
Add
Remove
OK
Cancel

4. When you are finished entering the data for the clinician, click *Ok*. You should now see a new entry in the main table for that clinician.



2.2.5 Deleting an existing clinician

To delete an existing clinician, simply select a row corresponding to the clinician in the table and click on *Delete Clinician*.



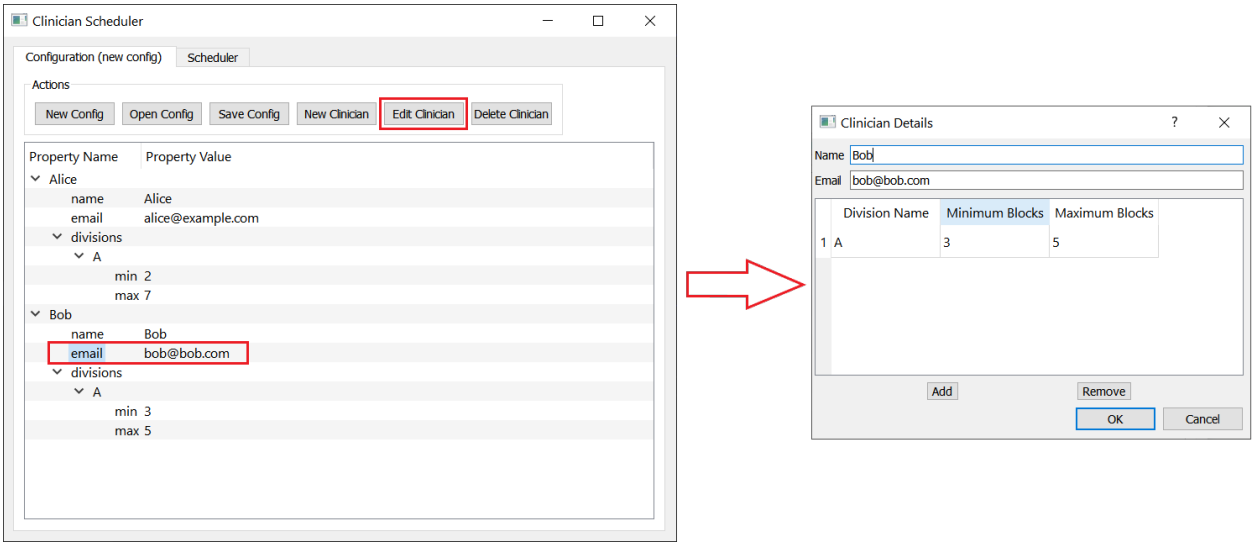
2.2.6 Editing an existing clinician

To edit the information of a clinician, select a row corresponding to the clinician in the table and click on *Edit Clinician*. You should see a dialog window where you can change the information. For more details on how to enter data in the edit dialog, see *Adding a new clinician*.

2.3 Scheduling

2.3.1 Generating a schedule

Once you have created a configuration file, you can switch over to the *Scheduler* tab of the application in order to generate a schedule.



1. From the scheduling tab, click on *Load* and select the configuration file that you generated in *Clinician Configuration*

<image placeholder>

2. Enter the calendar year for the schedule that you want to generate.

<image placeholder>

3. **(Optional)** In order to retrieve the time-off requests that were populated in Google calendar in *Adding clinician requests*, we need to specify the calendar ID. Open the calendar in your browser, and navigate to the *Settings and sharing* page. On the setting page, navigate to the *Integrate calendar* section, and copy the value under *Calendar ID* to your clipboard. Paste this value into the *Google Calendar ID* textbox on the *Scheduler* tab.

<image placeholder>

4. **(Optional)** If you supplied a calendar ID in step 3, you can configure the options *Retrieve Time-off Requests* and *Retrieve Long Weekends* as necessary. Enabling *Retrieve Time-off Requests* will read the time-off calendar events from the calendar specified in *Calendar ID*, while enabling *Retrieve Long Weekends* will read the holiday events from that calendar.

<image placeholder>

5. **(Optional)** In the case that you only need to generate a schedule for a subset of the calendar year, you can select the amount of blocks you need to generate by specifying a value in *Number of Blocks*. By default, the scheduler will generate a full schedule, corresponding to 26 blocks.

<image placeholder>

6. Click on *Generate*, and after a few moments you should see a preview of the generated schedule in the table.

   (Optional) See *Authentication* in case you encounter problems with Google calendar at this stage.

<image placeholder>

Note: It is possible that the scheduler will not be able to come up with a schedule that satisfies your constraints. You can try adjusting some constraints by changing the minimum and maximum number of blocks of clinicians in the configuration file. See *Clinician Configuration* for more information on changing the configuration file.

2.3.2 Exporting a schedule

If you are satisfied with the generated schedule, you can choose to export it as an Excel file. There are two format options: *Yearly Export* and *Monthly Export*.

<image placeholder>

Selecting the *Yearly Export* option will generate an excel file with a single sheet, displaying the clinicians that are covering a particular division for a given week or weekend. It is very similar to the table output in the application itself.

<image placeholder>

Selecting the *Monthly Export* option will generate a more detailed breakdown of the schedule, with a separate sheet for every month, detailing which clinician covers which division on which day.

<image placeholder>

2.3.3 Publishing a schedule to Google Calendar

If you are satisfied with the generated schedule, you can publish it to Google calendar, by clicking on *Publish*.

<image placeholder>

> **Warning:** This process might take some time, especially if the number of events to be published is quite large.

2.3.4 Clearing a published schedule

If you want to remove all the published events created by the application, simply click on *Clear*.

<image placeholder>

> **Warning:** This process might take some time, especially if the number of published events is quite large.