

External Data Storage REST API Implementation Guideline for Labvanced.com

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Usage: The main use case for the Labvanced External Data Storage REST API is to transfer participant data in “real time” to an external / remote server, instead of hosting the recorded data on the Labvanced servers.

PLEASE NOTE: Contrary to many API use cases, what is described here is NOT how to call the Labvanced API / endpoints (such a functionality does not exist for now), but rather how you must configure/implement your backend, such that our platform will be able to automatically call the endpoints you have implemented to send the participants data directly to your backend/database instead of ours.

Availability: This functionality is only available to Labvanced Lab license holders.

1. Setup in Labvanced

To use the REST API, one first has to activate the “external data storage” option in “study settings” of the respective Labvanced study (see screenshot):

External Data Storage

Save trial data on an external server. (Available for Lab license holders.)

IP Address:

Port:

URL Path:

1.1 Parameters:

IP Address: Enter your static IP address where your external server is running / publicly available.

Port: The port which should be used to send the data

URL Path: The URL path which should be appended after the port. This is particularly useful to “namespace” your projects / incoming data, such that data from different experiments are sent to a different URL path. The URL path is optional, but we strongly recommend to use it.

2. Create the server / script for receiving the data

Based on your settings in step 1, you have to implement a REST server which is available at the specified IP address, port, and url path. A simplified version / example of such a server is available on our Github page at:

https://github.com/Labvanced/python_REST_API_example/tree/main

2.1 Data format: Data is sent in JSON format for all routes but the “/file_upload” route. The “/file_upload” route (used for uploading binary files such as recorded videos or audio) is encoded as “multipart/form-data” So please make sure you parse the incoming data correctly as JSON or multipart/form-data / binary data.

2.2. When implementing your backend you have to implement / allow Cross Origin Resource Sharing (CORS). Particularly, you have to set the following headers:

“Access-Control-Allow-Origin” (include <https://www.labvanced.com/>),

“Access-Control-Allow-Methods” (include POST and OPTIONS),

“Access-Control-Allow-Headers” (include Content-Type)

2.3 Request Types: All request types are POST requests as they are used to send data out. At this point, a return value is only required for the “/file_upload” route. All other routes do not need a special return value.

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2.4 Types of requests / routes: Each time a participant takes part in a study, in total 8 different *types* of POST requests will be sent to the (external /your) server. The “/file_upload” route will only be used if your study includes an action to upload some recorded binary data (e.g. audio or video). Each type of POST request has a different route (url path), which will be appended to the specified URL path in step 1. Also each type of request has a different structure/payload, which should be accounted for when parsing and storing the data. See details in section 3.

3. API endpoint definitions / routes:

In the following, you will see a detailed explanation of each route / endpoint that is used/called when a participant takes part in the experiment. Ideally we suggest that you implement all of these endpoints (besides 3.1), and make sure all the data is appropriately parsed and stored in your database.

Which endpoints are used, which server is called when?

Endpoint 3.1 “/startExpPlayer” is only sent to the Labvanced server to load the experiment definition/JSON file and associated stimuli from our server.

Endpoints 3.2, 3.3, 3.4, 3.7, and 3.8 are sent both to the Labvanced server (needed for group balancing and general experiment flow) and the external/your server.

Endpoints 3.5 and 3.6 are only sent to the external/your server. Please note all trial/participant data is sent via route 3.6, which therefore is the most important endpoint to implement.

Endpoint 3.9 is only sent to the external/your server and called every time an “upload action” is executed to upload binary (audio or video) data.

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3.1 Loading of the experiment

Route: /startExpPlayer

Type: POST

Called when: The participant visits a certain experiment URL on labvanced.com

Main function on Lavanced server: Initializes the loading of the experiment.

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
isTestrun	Whether data is recorded or not	boolean	no
subject_code	Identifier of the subject via url param	JSON	no
token	A unique identifier for participants with longitudinal studies	Token identifier	no
askSubjData	Whether to show an initial survey to used to put subjects into different groups	boolean	yes

Note: Does not need to be implemented on external servers, as this only initializes the loading of the experiment from the Labvanced server to the client computer

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3.2 Group and session selection

route: /startFirstPlayerSession

type: POST

Called when: Route 3.1 “ /startExpPlayer” returns successfully from the Labvanced server.

Main function on Lavanced server: Used to assign group and session numbers to a subject (server side balancing)

payload: JSON with the following fields:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
subject_code	Identifier of the subject via url param	string	no
token	A unique identifier for participants with longitudinal studies	Token identifier	no
survey_data	JSON of the pre-study questionnaire, fields described below.	JSON	no
survey_data.selected Gender	Selected gender of the participant	string	no
survey_data.selected Age	Selected age of the participant	integer	no
survey_data.selected Country	Selected country/location of the participant	string	no
survey_data.selected Language	Selected (first) language of the participant	string	no
isTestrun	Whether data is recorded or not	boolean	yes
runOnlyGroupNr	Only used to test run a certain group number without data recordings	Integer false	no
runOnlySessionNr	Only used to test run a certain	Integer false	no

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	session number without data recordings		
groupNr	Group number for this subject	integer	yes
sessionNr	Session number in a longitudinal study	integer	yes
group_name	The name of the group for this subject	string	yes
session_name	The name of the session for this subject	string	yes
experiment_name	The experiment name (not the publication ame)	string	yes

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3.3 Start of the experiment

route: /setPlayerSessionStartedTime

type: POST

Called when: The participant presses “Start Experiment”

Function on Lavanced Server: Saves the start time, session and group name of the experiment and starts the experiment.

Payload:

Field name	description	data type	required
expId	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
start_time	Start time of the experiment	UNIX timestamp	yes
sessionNr	Session number in a longitudinal study	integer	yes
group Nr	Group number for this subject	integer	yes
token	A unique identifier for participants with longitudinal studies	Token identifier	A unique identifier for participants with longitudinal studies

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3.4 Add metadata information

route: /addMetaInfo

type: POST

Called when: The participant presses “Start Experiment”

Function on Lavanced Server: Saves the meta information on the server.

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
var_data	The JSON holding the meta information	JSON	yes
var_data.browserSpec	The browser which is used by the subject	string	no
var_data.versionSpec	The browser version which is used by the subject	string	no
var_data.systemSpec	The device type / OS which is used by the subject	string	no
var_data.agentSpec	The complete user agent string	string	no
var_data.fullscreen	Indicates If the study is always in fullscreen	boolean	no
var_data.timeDelayMean	The Javascript callback precision mean offset in milliseconds	float	no
var_data.timeDelayStd	The Javascript callback precision standard deviation in milliseconds	float	no
var_data.crowdsourcingCode	The crowdsourcing / completion code for subjects	string	no

var_data.crowdsourcinSubjectId	The crowdsourcing / worker id of the subject	string	no
var_data.subjCounterGlobal	A global subject counter for number of subject in the study	integer	no
var_data.subjCounterPerGroup	A subject counter per group in the study	Array of integers	no
var_data.roleId	The unique role id for multi-user studies of the subject	integer	no
var_data.multiUserGroupId	The global unique multi-user group id for multi-user studies	uuid	no
var_data.displayedLanguage	The selected display language for multi-language studies	string	no
var_data.pixelDensityPerMM	The pixel density of the screen	float	no
var_data.screenHeight	The screens' height in pixel	integer	no
var_data.screenWidth	The screens' width in pixel	integer	no
var_data.windowHeight	The window /viewport height in pixel	integer	no
var_data.windowWidth	The window/viewport width in pixel	integer	no

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3.5 Record information about a task

route: /recordStartTask

type: POST

Called when: A new tasks starts in the experiment flow

Function on Lavanced Server: Not called when external API requests are activated

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
blockNr	Current block number (increasing counter)	integer	yes
blockId	Unique Id ob the current block	uuid	yes
blockName	Name of the block	string	yes
taskNr	Current task number (increasing counter)	integer	yes
taskId	Id of the current task as defined in the editor (same between subjects)	uuid	yes
recTaskId	Server generated Id for the current recording task (different between subjects)	integer	yes
taskName	Name of the current task	string	yes
start_time	Start time of the task	UNIX timestamp	yes

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3.6 Record trial data

route: /recordTrial

type: POST

Called when: A trial is finished OR a custom record action is executed

Function on Lavanced Server: Not called when external API requests are activated.

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
recTaskId	Identifier for the current task	integer	yes
taskId	Id of the current task as defined in the editor (same between subjects)	uuid	yes
trialNr	Trial Number	integer	yes
recData	The main data / all user created variables per trial are stored here.	JSON	yes

Note: The exact data which is recorded per trial depends on the specific experiment and task. An overview for each study is available under the "Variables" tab of the specific experiment (see screenshot). Also please note that the external API variable names will be used as a key in the JSON structure. So please make sure that variable names are unique. Otherwise you would overwrite data. The Labvanced system usually enforces the user to use unique variable names.

CUSTOM VARIABLES [+ Add Variable](#)

VARIABLE NAME	USED IN TASK	DATA TYPE	DATA FORMAT	IS RECORDED	IS RESETTED
GazeX	Unused	numeric	scalar	true	false
GazeY	Unused	numeric	scalar	true	false
image rotation	task_1	numeric	scalar	true	false

OBJECT VARIABLES

VARIABLE NAME	USED IN TASK	DATA TYPE	DATA FORMAT	IS RECORDED	IS RESETTED
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FACTOR VARIABLES

VARIABLE NAME	USED IN TASK	DATA TYPE	DATA FORMAT	IS RECORDED	IS RESETTED
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SYSTEM VARIABLES

VARIABLE NAME	USED IN TASK	DATA TYPE	DATA FORMAT	IS RECORDED	IS RESETTED
Subject_Code	Unused	string	scalar	true	false
Subject_Nr	Unused	numeric	scalar	true	false
Subject_Nr_Per_Group	Unused	numeric	scalar	true	false

3.7 Finish the experiment with success

route: /finishExpSession

type: POST

Called when: The experiment is finished successfully

Function on Lavanced Server: Finishes the study and flags the data set as completed (important for balancing).

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
end_time	Time when the experiment finished	Unix Timestamp	yes
var_data	Same as the var data in the "/addMetaInfo" route (updated info)	JSON	yes
nextStartTime	Next start time (for longitudinal studies only)	Unix Timestamp	no
nextEndTime	Next end time (for longitudinal studies only)	Unix Timestamp	no
reminderTime	Time until next start time (for longitudinal studies only)	Time string	no
selectedEmail	Email to send participation reminder (for longitudinal studies only)	Email address	no
emailReminder	When to send the reminder (for longitudinal studies only)	string	no

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3.8 Finish the experiment with failure

route: /errExpSession

type: POST

Called when: The experiment is aborted with an error

Function on Lavanced Server: Aborts the study and flags the data set as incomplete

Payload:

Field name	description	data type	required
expld	Unique identifier for the study	integer	yes
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
err_msg	The error message	string	yes

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3.9 Upload binary (audio or video) data

route: /file_upload

type: POST

Called when: An upload action is executed in the event system associated to some audio or video recording object.

Function on Lavanced Server: Not called when external API requests are activated.

Note: The server must send return values for this route (explained below). If this is not done the “onUploadComplete” trigger is not executed and the experiment cannot propagate correctly. Also note that the data in this route is encoded as “multipart/form-data” as it includes both binary and non-binary data.

Payload:

Field name	description	data type	required
expSessionNr	Unique identifier for the recording session for this participant (counting upwards)	string	yes
newFileName	The suggested file name to store the file. The file name includes the associated variable name, and the current, block ,task and trial number.	string	yes
myFile	The actual file / binary data	binary	yes

Required Response:

Field name	description	data type	required
file_guid	Global Unique Identifier (guid) for the recorded file. This has to be generated server side and will be saved in the variable associated with the file such that later it is easy to understand which file came from which recording object.	uuid	yes
file_name	The resulting filename the server used to save the file. This can be (but does not have to be) the same file name suggested by the client in the request. This will also be stored in the associated variable.	string	yes

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