

# Detailed Experimentation Environment guide

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# 1. Introduction

The experimentation environment is in general responsible for the creation/modification of FIspace experiments and their execution. These experiments are a set of several steps relative to a specific scenario (e.g. greenhouse, logistics, washing machine, FIspace platform) .Each step has specific description, parameters and a script/jar/executable/REST that is responsible for executing the specific scenario's functionality for this step.

The experimentation environment consists of a frontend and a backend implementation.

- The experimentation environment frontend is hosted here:  
<http://37.131.251.58/grouped/>
- Also integration with IDM has been recently achieved so that the UI is accessible only from authorized users and it can be seen here: <http://37.131.251.58:8080/>

## 1.1 Greenhouse experiment

Below a description for the creation / execution of the greenhouse advice scenario follows.

Some of the information given must be exact for the correct definition of the experiment .Other information is optional or not used so a test value can be given.

- 1) The experimenter defines and creates the Greenhouse experiment which has two steps.
  - a) Get the sensor values of a specific farm from the backend simulator.
  - b) Feed these values to the expert system and get the advice.
- 2) The new experiment appears in the experiments list.
  - The details of the experiments can be seen
  - The experiment can be deleted.
- 3) The experiment search functionality shows available experiments based on the query in a full text context.
- 4) The experimenter can see all the details of all experiments.
- 5) The experimenter executes the experiment.
- 6) A new execution id is produced.
- 7) The raw logs for the execution are shown.
- 8) A report based on these logs can be created with the following KPIs
  - a)Response time for the whole execution
  - b)Step execution time
  - c)Validity of response time
  - d)Success rate of steps
- 9) The experimenter can see the reports that are produced.

## 2. Detailed Greenhouse experiment

### 2.1 Create a greenhouse experiment with two steps

Experiment CRUD Service

[Create](#) [Read](#) [Get All](#) [Delete](#) [Search](#)

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#### Create Experiment

  

#### Step 0:

  

#### Link:

  

[Add another step](#)

[Create Experiment](#)

Figure 1 experiment crud

#### Create Experiment

Form input	Value	Type
Experiment ID	give a unique id e.g 13ldfa9	
Experiment Name	e.g Greenhouse experiment	

	demo	
Creator	e.g Bill	
Guid ID	same as experiment id	
version	e.g 1.3	
ExperimentType	Greenhouse	<b>Must be exactly this. If it is another type Other for example.</b>

#### Step 0

Form input	Value	Type
Actor	e.g Bill	
Description	REST	<b>Must be exactly this. It is a REST call</b>
Data Description,	e.g test	
Expected Result	e.g test	
Id	a unique id e.g dakd032	

#### Link

Form input	Value	Type
Additional data	e.g test	
Name	e.g mylink	
Uri	<a href="http://37.131.251.58:10008/BackendSimulator/getSensorData/farmid/4">http://37.131.251.58:10008/BackendSimulator/getSensorData/farmid/4</a>	<b>Must be exactly this. It is the link where to fetch data from specific farm.</b>
Description	GET	<b>Must be exactly this. It is a GET call.</b>
V User Script	test	

#### Step 1

Form input	Value	Type
Actor	e.g Bill	
Description	JAR	<b>Must be exactly this.</b>
Data Description,	e.g test	
Expected Result	e.g test	
Id	a unique id e.g dakd0332	

Link

Form input	Value	Type
Additional data	e.g test	
Name	e.g mylink	
Uri	test	
Description	test	
V User Script	/home/ubuntu/v1.jar	<b>Must be exactly this. It is a specific jar executable</b>

## 2.2 Read an experiment

1.

Experiment CRUD Service

Create Read Get All Delete Search

-- Select Experiment -- Refresh experiments

-- Select Experiment --

Greenhouse testing haifa

Experiment with idm

Experiment without idm

2.

Experiment CRUD Service

Create Read Get All Delete Search

Experiment with idm Refresh experiments

Read Experiment

Read Experiment

Name	Id	Version	Steps	Creator	Type
Experiment with idm	755345	1.2	2	Bill	Greenhouse

Figure 2 Read experiment

## 2.3 Get all experiments

Experiment CRUD Service

Create Read **Get All** Delete Search

Get All Experiments

Get All Experiments	
Experiment 1234a	
Type	Experiment
Name	Greenhouse testing haifa
Creator	bill
Guid	1234a
Version	1.4
ExperimentType	Greenhouse
Step 0	
Actor	Bill
Data Description	test
Description	RESTGET
Expected Result	test
Link description	GET
Link name	test
Link uri	http://37.131.251.58:10008/BackendSimulator/getSensorData/farmid/4
VUser Script	test
Step 1	
Actor	Bill
Data Description	test

Figure 3 get all experiments

## 2.4 Search Experiment

### Experiment CRUD Service

1.

Create Read Get All Delete Search

experiment

search

clear

2.

### Experiment CRUD Service

Create Read Get All Delete Search

experiment

search

clear

Name	Id	Version	Steps	Creator	Type
Greenhouse experiment demo 45	GH1345	1.5	2	Me	Greenhouse
Experiment with idm	755345	1.2	2	Bill	Greenhouse
Experiment without idm	909001	1.4	2	bill	Greenhouse

Figure 4 Search experiment

## 2.5 Execution Management of an Experiment

We refresh the experiments list and pick the created experiment. Then we start the execution. We wait for a while until a new execution id emerges. Afterwards we can push the get logs button and see what happened in the experiment. We can see the sensor values and the response from the expert system for these values.

**1.** Execution Manager Service

-- Select Experiment -- Refresh experiments

Start New Execution By Id

Start New Execution By Id

**2.** Execution Manager Service

Experiment without idm Refresh experiments

-- Select Experiment --  
Greenhouse testing haifa  
Experiment with idm  
Experiment without idm

Start New Execution By Id

**3.** Execution Manager Service

Experiment without idm Refresh experiments

Start New Execution By Id

Start New Execution By Id

ExecutionId:

aa34a2f9-381b-4d21-b574-e7da7bc9e832

Figure 5 Execution start

Execution Log Manager

stepNumber	timestamp	executionId	actual result
0	2014-07-21 15:00:59.162	aa34a2f9-381b-4d21-b574-e7da7bc9e832	Started executing step 0 execution...  <?xml version="1.0" encoding="UTF-8" standalone="yes"?><sensorData><sensorData><co2>224.0</co2><cropFieldId>cropfieldid</cropFieldId><ec>22.0</ec><luminosity>22.0</luminosity><ph>22.0</ph><relHumidity>52.0</relHumidity><soilMoisture>22.0</soilMoisture><temperature>22.0</temperature><timestamp>Wed Feb 26 14:56:14 UTC 2014</timestamp></sensorData>
1	2014-07-21 15:00:59.895	4d21-b574-e7da7bc9e832	Started executing step 1 execution...
1	2014-07-21 15:01:03.087	aa34a2f9-381b-4d21-b574-e7da7bc9e832	Set of actions proposed: ===== Irrigation with solution-fertilizer CaO 12% 150 ml/m3 of water Flusing with rainwater 8 m3 / arce two times Irrigation with nutrient solution depending on the development phase of the tomato eg N 200mg/lit, P 30mg/lit, K 200mg / l Mg, 30mg/lit Ca, 200mg/lit, by EC 2,5 dc / m, = 0.015 NH4/TotalN Set of alerts proposed: ===== Trialeurodes vaporarium (Aleurodidae) Liriomyza bryoniae, Liriomyza trifolii, Liriomyza huibobrensis (Agromyzidae) Aphididae Oidium sp.

Figure 6 Log results of execution (sensor data and actions, alerts from expert system)

## 2.6 Report and KPIs based for specific execution

From the KPIs list we pick a KPI and press Create Report.

Afterwards we can push get Report and see the KPI value. We can do this procedure for all the KPIs and Get Report returns all of them.

User and Experimentation   Execution Management   Resources, Reports and KPI   Flsp

**1.** Resources, Reports and KPI Management

Report Manager

Create Report By Execution

ResponseTime ▾  
 -- Select KPI --  
 ResponseTime   Create report  
 StepTime

ValidRT  
 SuccessRate   ution  
 Get Report

Get Reports By Execution **2.**

id	description	KPIs
c031e67c-47b4-450f-8198-ef5ebe72ed18	Experiment without idm	StepNumber 0:100%
	SuccessRate KPI:	StepNumber 1:100%
0d95d648-a226-4457-8b3d-d68ba3e674ce	Experiment without idm	ValidRT :yes
	ValidRT KPI:	
1c516420-a65e-42d0-816f-16b5b242438c	Experiment without idm	StepNumber 1 Time(ms):3192
	StepTime KPI:	StepNumber 0 Time(ms):417
464420b9-26a4-42e8-a50d-ae95879b5aa	Experiment without idm	ResponseTime(ms):3925
	ResponseTime KPI:	

Figure 7 Reports and KPIs

### 3. Further experimentation

An experiment definition can also be created for any kind of experiment however with some constraints. For example a non-greenhouse experiment can be created with several steps, executables per step and various definitions. Therefore someone can see the log results of the steps and some KPIs such as response time which are not domain specific.