Email to 3D Print

Testing **Document**

Revised 10 November **2014**

Sections

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1 Overview and Revision History

The purpose of **this** document **is to** present the planned test cases for the Email to 3D Print project, and to provide a history of test results as testing progresses.

Version	Date	Description
1	07 Nov 2014	1st Draft
2	09 Nov 2014	Revised original draft and added test cases
3	10 Nov 2014	Document posted on project website

2 Unit Testing

Unit tests include test cases specific to the major modules of the project, as well as functions contained within each individual module. Our plan for unit testing our project will involve (ideallly automated) testing of the individual parts of the project. If they each pass the test cases, we can be confident that they behave as expected.

2.1 Config.py

Number	Description	Input	Expected Output
2.1.1	Normal Case	Reads configuration file	Configuration variable values available for other modules to use as needed
2.1.2	Error Case	Configuration file malformed	Exit with informative error message
2.1.3	Error Case	Configuration file not found	Exit with informative error message

2.2 Converter.py

Number	Description	Input	Expected Output
2.2.1	Normal Case	STL model	No conversion performed
2.2.2	Normal Case	OBJ model	Exit with informative error message
2.2.3	Error Case	Any other file type	No conversion performed Error noted in log file
2.2.4	Error case	Model has STL or OBJ extension but is another file type	No conversion performed Error noted in log file
2.2.5	Error case	OBJ file conversion failed	Error noted in log file

2.3 Logger.py

Number	Description	Input	Expected Output
2.3.1	Normal Case	Log file found	Log file available for update
2.3.2	Error Case	Log file not found	Raise exception and exit

2.4 Mailfetch.py

Number	Description	Input	Expected Output
2.4.1	Normal Case	Reads configuration file	Configuration variable values available to Mailfetch
2.4.2	Normal Case	No unread messages found	No further action performed
2.4.3	Normal Case	Unread message found Has no attachments	No further action performed
2.4.4	Normal Case	Unread message found 1 STL or OBJ attachment	Create PrintJob object Save attachment to disk Save sender username in object
2.4.5	Normal Case	Unread message found >1 STL or OBJ attachment	Create PrintJob object for each attachment Save each attachment to disk Save sender username in each object
2.4.6	Error Case	Configuration variable missing	Raise exception, exit, email admin, log error
2.4.7	Error Case	Opening connection fails	Raise exception, exit, email admin, log error
2.4.8	Error Case	Login to Gmail fails	Raise exception, exit, email admin, log error
2.4.9	Error Case	Unable to write attachment to disk	Raise exception, exit, email admin, log error

2.5 Mailsend.py

Number	Description	Input	Expected Output
2.5.1	Normal Case	Reads configuration file	Configuration variable values available for Mailsend
2.5.2	Normal Case	Receiver address, stage	Email receiver with content depending on stage value
2.5.3	Error Case	Configuration variable missing	Exit with informative error message
2.5.4	Error Case	Opening connection fails	Raise exception, exit, email admin, log error
2.5.5	Error Case	Login to Gmail fails	Raise exception, exit, email admin, log error
2.5.6	Error Case	Message send fails	Raise exception, exit, email admin, log error

2.6 Pipeline.py

Number	Description	Input	Expected Output
2.6.1	Normal Case	Instantiated PrintJob	Stage updated based on pipeline point Contains Member Variables: Sender Files Time Status

2.7 Printer.py

Number	Description	Input	Expected Output
2.7.1	Normal Case	Reads configuration file	Config variable values available for other modules
2.7.2	Normal Case	PrintJob with successful printing	Admin removes object from build plate Admin places printed model in box for customer Successful job logged Email to customer
2.7.3	Error Case	PrintJob not printed	Log error, email admin and customer
2.7.4	Error Case	Configuration variable missing	Raise exception, exit, email admin, log error
2.7.5	Error Case	File to be printed not found	Log error, email admin

2.8 Slicer.py

Number	Description	Input	Expected Output
2.8.1	Normal Case	Reads configuration file	Config variable values available for other modules
2.8.2	Normal Case	STL model file, correctly sliced	G-code file
2.8.3	Error Case	STL model file, slicing error	Log error, email customer
2.8.4	Error Case	Configuration variable missing	Raise exception, exit, email admin, log error

2.9 Validator.py

Number	Description	Input	Expected Output
2.9.1	Normal Case	Reads configuration file	Config variable values available for other modules
2.9.2	Normal Case	Valid STL model file	Continue to next stage in pipeline
2.9.3	Normal Case	Invalid STL model file	Log error, email customer

3 Integration Testing

Integration tests examine the behavior between interacting modules of the project. The Main.py module functions much like a driver, calling other program modules when they are needed. This kind of testing will simply make sure that the data flows between modules according to the spec.

Number	Description	Input	Expected Output
3.1.1	Normal Case	Completed print job	A part is successfully printed Email sent to the print job originator with news of success
3.1.2	Normal Case	Failure at print stage	A part was not printed Job originator is notified by email of failure during printing. Temporary files are cleaned up.
3.1.3	Normal Case	Failure at slicing	A part was not printed Job originator is notified by email of failure during slicing. Temporary files are cleaned up.
3.1.4	Normal Case	Failure at validation	A part was not printed Job originator is notified by email of failure during validation. Temporary files are cleaned up.
3.1.5	Normal Case	Failure at conversion	A part was not printed Job originator is notified by email of failure during conversion. Temporary files are cleaned up.
3.1.6	Error Case	Config module not present	Raise exception, exit, email admin, log error
3.1.7	Error Case	Logger module not present	Raise exception, exit, email admin, log error
3.1.8	Error Case	Mailfetch module not present	Raise exception, exit, email admin, log error

3.1.9	Error Case	Converter module not present	Raise exception, exit, email admin, log error
3.1.10	Error Case	Validator module not present	Raise exception, exit, email admin, log error
3.1.11	Error Case	Slicer module not present	Raise exception, exit, email admin, log error
3.1.12	Error Case	Print module not present	Raise exception, exit, email admin, log error
3.1.13	Error Case	Mailsend module not present	Raise exception, exit, email admin, log error

4 System and Customer Testing

This is the final phase of testing, and its purpose is to verify functionality at the customer site, on customer provided hardware, using a customer installed Linux distribution and Python 3.x environment. The integration test cases will be repeated, in the customer's production environment.

Number	Description	Input	Expected Output
4.1.1	Normal Case	Completed print job	A part is successfully printed Email sent to the print job originator with news of success
4.1.2	Normal Case	Failure at print stage	A part was not printed Job originator is notified by email of failure during printing.
4.1.3	Normal Case	Failure at slicing	A part was not printed Job originator is notified by email of failure during slicing
4.1.4	Normal Case	Failure at validation	A part was not printed Job originator is notified by email of failure during validation
4.1.5	Normal Case	Failure at conversion	A part was not printed Job originator is notified by email of failure during conversion

5 Completed Tests and Results

This section provides a log of test results, and will be updated as formal testing is performed.

Test Number	Description	Date Performed	Pass/Fail