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**How Reqtify report generation works**

OBJECT

This document describes how to install and configure Jenkins

SUMMARY

/

CONCLUSION

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| STATUS: | For comments | ✓ |
|  | For application |  |

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| Established by | Reviewed by | Approved by |
| Name: Ardeleanu Lucian  Date: 15/02/2020  Visa: | Name:  Date:  Visa: | Name:  Date:  Visa: |

The present document contains **12 pages**, including the flyleaf and the appendices.

# EVOLUTION OF THE DOCUMENT

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| --- | --- | --- | --- | --- |
| **Issue** | **Date** | **Author** | **Rev.** | **Motive and nature of the modifications** |
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# RELEVANT DOCUMENTS

|  |  |  |
| --- | --- | --- |
| **N°** | **Title** | **Reference** |
|  | SBE\_PP4G\_HowTo\_Jenkins.docx |  |

# GLOSSARY OF TERMS / EXPRESSIONS

|  |  |
| --- | --- |
| ***Term*** | ***Definition*** |
| ***BAT*** | *Batch File ( Windows batch file extension )* |
|  |  |
|  |  |

# PREREQUISITES

## PTC Source Integrity

You must have instaled on workbench the PTC Source Integrity in order to launch scripts to work.

## DOORS Standalone Application

You must install DOORS 9.7 with licence on workbench. DOORS is needed by Reqtify tool to generate reports.

NOTE: You must install the standalone application of DOORS, not the Citrix DOORS, because Reqtify can only access project requirements from DOORS application.

## Reqtify 2018 Standalone Application

This tool is needed for generating reports from entire project and requirements

## Python ( last version ) – NOT MANDATORY, OPTIONAL

If generated .exe files from source scripts does not work then a python envoirment is needed in order to run python scripts. It is recomented to use last version of Python in order to avoid errors.

### USED LIBRARIES AND DEPENDENCIES:

* **argparse** – Python library to add arguments in order to call .exe generated file. Used in all scripts.
* **PIL ( Pillow Lib )** – Python library needed for extracting images from generated reports.
* **win32com.client as win32** – Python library needed to open and manipulate Excel data, needed to open generated reports.
* **os, os.path, subprocess, sys, glob, shutil** – Python libraries to communicate with Command Prompt and execute batch line commands
* **datetime** – Python library used only in Jenkins\_check\_ptc\_reports script, needed to check how much time has elapsed until reports has generated.
* **pyautogui** – Python library needed to detect buttons and click on them. This python library will search a button on screen saved in buttons folder and will click on it or locate it.
* **Time** – Python library needed to delay and pause in code.

## Jenkins Automation Server

In order to alert users that the reports have been generated and to send the reports by email and the graphics included in the reports, a Build Job has been set up in the Jenkins installed server, which will detect if the reports have been updated using the script described in subchapter 4.7.

# HOW REPORTS ARE GENERATED

In order to generate Reqtify reports, several scripts were created in Python, each script having a specific role in the entire generation process. Since these scripts cannot work from Jenkins, a batch file was created containing the call to these scripts. The respective batch file will be run every night at a certain time using the Windows Task Scheduler in order to generate daily various reports. (ex: SDM, SwArchMatrix, SRM)

In order to generate reports, an batch file with entire workflow has been created: **Reqtify\_bench\_Workflow.bat**  This batch file will call all necessary scripts in order to generate reports and check in generated reports in PTC.

In order to run this batch file on other workbench, it is necesarly to modify paths for each scripts.

If it is necessary to generate reports every night from a certain time, the batch file can be called within a Task created within the Windows Task Scheduler application. Thus, by activating a task that runs every night, new reports will be generated daily that will be uploaded to the PTC.

New Version of written Batch File let’s user to configure report generation from paths. In order to modify report generation paths, please refer to Batch File Modifications in Notepad++.

To generate reports, next stepts must been accomplished:

## Resyncronize Entire Project

This is made possible with **PTC\_Resyncronizer.py** script. This script will call si.exe engine from PTC, will connect with given username and password to PTC account and will resyncronize a given folder with new data from PTC.

Script arguments are:

* -i - Path to folder to resync. You must add at final path /project.pj.
* -u - Username for PTC Account
* -p - Passowrd for PTC Account.

In **Reqtify\_bench\_Workflow.bat,** this script is called only in first position because only once is needed to resyncronize entire project before generating reports.

## Mount S Drive and Remove Read Only

S: drive is needed for Reqtify tool to search in entire project. In order to mount S drive, necessarily scripts has been called in **Reqtify\_bench\_Workflow.bat** to mount drives and remove read-only attribute.

## Generate Reqtify Reports

Now, as S: drive is mounted and entire project has been resyncronized, it is time to generate reports using Reqtify. For this step to be accomplished, Reqtify\_report\_generator.py script has been created.

To generate every time new reports based on new requirements from DOORS, some intermediate files must be removed.

All files from intermediate folder ( located in Reqtify Project Path ) except System Architecture EA.xml file must been deleted. File PP4G\_E\_Ph2.rqtfimage must be deleted too in order to remove all previously generated data and to recreate image file data based on new DOORS Requirements.

After deleting previously generated reports and intermediate files, it is needed to assure that all EXCEL.EXE processes are closed ( because Reqtify generate reports based on excel engine ).

For avoid some issues and errors from Reqtify Tool at startup, it should been open and close 2 times.

After launch it, it should been maximized in order to locate correctly buttons on screen. After maximizing the window, the Reqtify project must be opened.

Thus, by pressing the Open Project button, it is necessary to enter the path to the Reqtify project and then choose the PP4G\_E\_Ph2.rqtf file and open it. If the intermediate files have been successfully deleted, a login box will appear on the screen requiring you to enter a DOORS username and password.

After entering the credentials, it will start loading files and requirements from DOORS.

Once all the requirements for generating the reports have been uploaded, the reports can be generated.

On average, loading DOORS requirements takes about an hour.

The reports are generated by pressing the Reports button, then Project Reports-Architecture and the report to be generated is chosen. In the case of this script, the reports were created that contain in their name, at the end, the word Jenkins.

Thus, first the Software Architecture Matrix report will be generated, then the Software Design Matrix report and finally the Software Requirement Matrix report.

On average, generating reports and retrieving data from DOORS takes between one hour and 30 minutes and 2 hours.

The arguments required for this script are as follows:

* -o - Path where to generate reports
* -p - Reqtify Project Path

## Lock And Check In generated reports in PTC

After generating the reports, it is necessary for the reports to be uploaded to the PTC in the Reports folder. Thus, the script created PTC\_Check\_In\_Members.py aims to block the files (file) that was assigned as an argument and then upload it to PTC.

It is necessary to upload them to the PTC because this is the only way the Jenkins server can identify if the reports have been generated and notify their generation by sending an email.

The arguments of this script are as follows:

* -i - Path to folder to resync. Add at final path /project.pj
* -u – Username for PTC Account
* -p – Passowrd for PTC Account
* -d - Change Package ID where to check in members

## Extracting Graphics from generated reports

After uploading the generated reports in PTC, the export\_graphics\_from\_reports.py script is called in order to open an EXCEL file and extract the graphs from it, if the respective graphs have a size specified in the script. Thus, after opening each report, the cell necessary to enter the current Release will be replaced with the Auto Generated message and all the component images of the file will be extracted and saved in .png format.

The arguments needed for this script are:

* -i – Path to file to extract graphs
* -o – Path to folder where to save extracted images

This script is called 3 times, for each report generated separately.

## Lock And Check In extracted images in PTC

After extracting the images from the generated reports, it is necessary for these images to be uploaded to the PTC. Thus, by calling the PTC\_check\_in\_members.py script, the images inside the exported\_graphics directory will be uploaded to the PTC.

It is necessary to upload them to the PTC in order to be retrieved by the Jenkins server in order to send the notification email.

## Check If Reports has been uploaded in PTC

In order to alert users that the reports were generated and to send reports by email and the graphs contained in the reports, a Build Job was set up within the Jenkins installed server, which will detect if the reports have been updated using the Jenkins\_check\_ptc\_reports.py script.

Thus, this script will resynchronize the path of the given folder and will check if the files within this path have been uploaded in the last 8 hours since this script was called. In order to be able to signal the result of the verification, the script will return the error code 0 which represents that the files were uploaded in less than 8 hours in PTC and the error code 1 otherwise.

Checking the scripts is done both by time (check if the files have been modified in the last 8 hours) and date (check if the files have been changed on the current day).

The arguments needed for this script are:

* -i - Path to folder to check.
* -u – Username for PTC Account
* -p – Passowrd for PTC Account