

## **SUM AUTOMATION**

### **Robot Framework**

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### **Installations Required**

Python 3.8.2 (Latest Version):

Selenium:

Robot Framework:

Robot Framework Libraries:

Python Libraries:

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Ping and SSH on to the server:

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# SUM AUTOMATION

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## Robot Framework

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Robot Framework is a generic open source automation framework for acceptance testing, acceptance test driven development (ATDD), and robotic process automation (RPA). It has easy-to-use tabular test data syntax and it utilizes the keyword-driven testing approach. Its testing capabilities can be extended by test libraries implemented either with Python or Java, and users can create new higher-level keywords from existing ones using the same syntax that is used for creating test cases.

### Libraries Used:

1. **Built-in:**

This is the default library that need not be included at the beginning of the Robot code.

<https://robotframework.org/robotframework/latest/libraries/BuiltIn.html>

2. **Operating System:**

This library is required to access the file systems and command prompt if required.

<https://robotframework.org/robotframework/latest/libraries/OperatingSystem.html>

3. **Collections:**

This library is required to create List and Dictionaries. It also has all the operations that has to be done on Lists and Dictionaries.

<https://robotframework.org/robotframework/latest/libraries/Collections.html>

4. **String:**

This library includes strings and its operations. Conversions, Splitting, Reversing etc.

<https://robotframework.org/robotframework/latest/libraries/Collections.html>

5. **Process:**

This library is used to start any windows process even the terminal. It is also used to terminate certain processes. For example in order to terminate the web browser this library is used.

<https://robotframework.org/robotframework/latest/libraries/Process.html>

6. **Selenium2Library:**

This library is used simulate the user actions on the web browser. With the help of web driver, it controls the actions of the web-browser.

<https://robotframework.org/Selenium2Library/Selenium2Library.html>

## Installations Required

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### Python 3.8.2 (Latest Version):

- Go to <https://www.python.org/downloads/> and download latest version of python for windows/linux.
- Go to the directory where python has been installed. Copy the path to python.exe and scripts. Add it to the system variables.
- Open command prompt and type "py" to verify the proper installation of python.
- Install PIP from any git repository.
- Note: Remove previous versions of python before the installation.

## Selenium:








- Open command prompt and type "pip install -U selenium"

```
C:\Users\ssumanth>pip install -U selenium
Collecting selenium
  Using cached selenium-3.141.0-py2.py3-none-any.whl (904 kB)
Requirement already satisfied, skipping upgrade: urllib3 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from selenium) (1.25.8)
Installing collected packages: selenium
Successfully installed selenium-3.141.0
```

















- Enter into the python environment(just enter py or python) and enter "from selenium import webdriver". No error should indicate the proper installation.

```
C:\Users\ssumanth>py
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> from selenium import webdriver
>>>
```

- Download selenium web-driver (particular web browser has particular web-drivers). Download that version of web-driver which supports the web browser you have. (For Firefox it is geckodriver.exe) <https://github.com/mozilla/geckodriver/releases> .

 <a href="#">geckodriver-v0.26.0-linux32.tar.gz</a>	2.22 MB
 <a href="#">geckodriver-v0.26.0-linux64.tar.gz</a>	2.28 MB
 <a href="#">geckodriver-v0.26.0-macos.tar.gz</a>	1.91 MB
 <a href="#">geckodriver-v0.26.0-win32.zip</a>	1.37 MB
 <a href="#">geckodriver-v0.26.0-win64.zip</a>	1.46 MB
 <a href="#">Source code (zip)</a>	
 <a href="#">Source code (tar.gz)</a>	

- Copy the geckodriver.exe file to the python **scripts** folder.

 DLLs	1/14/2020 10:09 AM	File folder	
 Doc	1/14/2020 10:08 AM	File folder	
 ExcelRobotTest	3/17/2020 8:29 PM	File folder	
 include	1/14/2020 10:08 AM	File folder	
 Lib	1/14/2020 10:08 AM	File folder	
 libs	1/14/2020 10:08 AM	File folder	
 <b>Scripts</b>	3/17/2020 8:54 PM	File folder	
 tcl	1/14/2020 10:09 AM	File folder	
 Tools	1/14/2020 10:08 AM	File folder	
 LICENSE.txt	12/18/2019 11:26 ...	Text Document	31 KB
 NEWS.txt	12/18/2019 11:27 ...	Text Document	859 KB
 python.exe	12/18/2019 11:26 ...	Application	96 KB
 python3.dll	12/18/2019 11:26 ...	Application extens...	58 KB
 python38.dll	12/18/2019 11:26 ...	Application extens...	3,834 KB
 pythonw.exe	12/18/2019 11:26 ...	Application	94 KB
 vcruntime140.dll	12/18/2019 11:27 ...	Application extens...	85 KB

## Robot Framework:

- Open command prompt and enter "pip install robotframework"

```
C:\Users\ssumanth>pip install robotframework
Collecting robotframework
  Using cached robotframework-3.1.2-py2.py3-none-any.whl (602 kB)
Installing collected packages: robotframework
Successfully installed robotframework-3.1.2
```

- verifying the installation  
cmd>> pip show robotframework  
cmd>> pip check

```
C:\Users\ssumanth>pip show robotframework
Name: robotframework
Version: 3.1.2
Summary: Generic automation framework for acceptance testing and robotic process automation (RPA)
Home-page: http://robotframework.org
Author: Pekka Klärck
Author-email: peke@eliga.fi
License: Apache License 2.0
Location: c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages
Requires:
Required-by: robotframework-seleniumlibrary, robotframework-excellib, robotframework-excel, robotframework-datadriver
```

- Add ".\python38-32\lib\site-packages" to the system variables. This is the folder where all the libraries of robot framework would be present.

## Robot Framework Libraries:

- pip install selenium2library

```
C:\Users\ssumanth>pip install robotframework-selenium2library
Collecting robotframework-selenium2library
  Using cached robotframework_selenium2library-3.0.0-py2.py3-none-any.whl (6.2 kB)
Requirement already satisfied: robotframework-seleniumlibrary>=3.0.0 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from robotframework-selenium2library) (4.2.0)
Requirement already satisfied: robotframework>=3.0.4 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from robotframework-seleniumlibrary>=3.0.0->robotframework-selenium2library) (3.1.2)
Requirement already satisfied: selenium>=3.141.0 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from robotframework-seleniumlibrary>=3.0.0->robotframework-selenium2library) (3.141.0)
Requirement already satisfied: urllib3 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from selenium>=3.141.0->robotframework-seleniumlibrary>=3.0.0->robotframework-selenium2library) (1.25.8)
Installing collected packages: robotframework-selenium2library
Successfully installed robotframework-selenium2library-3.0.0
```

- No need to install other libraries as it will be automatically installed with robot framework.

## Python Libraries:

- pip install paramiko

```
C:\Users\ssumanth>pip install paramiko
Collecting paramiko
  Downloading paramiko-2.7.1-py2.py3-none-any.whl (206 kB)
    |#####| 206 kB 328 kB/s
Collecting cryptography>=2.5
  Downloading cryptography-2.8-cp38-cp38-win32.whl (1.3 MB)
    |#####| 1.3 MB 501 kB/s
Collecting bcrypt>=3.1.3
  Downloading bcrypt-3.1.7-cp38-cp38-win32.whl (26 kB)
Collecting pynacl>=1.0.1
  Downloading PyNaCl-1.3.0-cp38-cp38-win32.whl (179 kB)
    |#####| 179 kB 384 kB/s
Requirement already satisfied: six>=1.4.1 in c:\users\ssumanth\appdata\local\programs\python\python38-32\lib\site-packages (from cryptography>=2.5->paramiko) (1.11.0)
Collecting cffi!=1.11.3,>=1.8
  Downloading cffi-1.14.0-cp38-cp38-win32.whl (165 kB)
    |#####| 165 kB 312 kB/s
Collecting pycparser
  Downloading pycparser-2.20-py2.py3-none-any.whl (112 kB)
    |#####| 112 kB 409 kB/s
Installing collected packages: pycparser, cffi, cryptography, bcrypt, pynacl, paramiko
Successfully installed bcrypt-3.1.7 cffi-1.14.0 cryptography-2.8 paramiko-2.7.1 pycparser-2.20 pynacl-1.3.0
```

## SSH setup on Windows: (Required by target node):

- complete setup guide is provided in this link [https://winscp.net/eng/docs/guide\\_windows\\_openssh\\_server](https://winscp.net/eng/docs/guide_windows_openssh_server) .
- Download the latest OpenSSH for Windows binaries (package OpenSSH-Win64.zip or OpenSSH-Win32.zip)
- As the Administrator, extract the package to C:\Program Files\OpenSSH
- As the Administrator, install sshd and ssh-agent services with the command: powershell.exe -ExecutionPolicy Bypass -File install-sshd.ps1 (must be present in the directory where openSSH is extracted).
- Either run the following PowerShell command (Windows 8 and 2012 or newer only), as the Administrator: New-NetFirewallRule -Name sshd -DisplayName 'OpenSSH SSH Server' -Enabled True -Direction Inbound -Protocol TCP -Action Allow -LocalPort 22
- Or go to Control Panel > System and Security > Windows Firewall1 > Advanced Settings > Inbound Rules and add a new rule for port 22.
- Go to Control Panel > System and Security > Administrative Tools and open Services. Locate OpenSSH SSH Server service.
- If you want the server to start automatically when your machine is started: Go to Action > Properties. In the Properties dialog, change Startup type to Automatic and confirm.
- Start the OpenSSH SSH Server service by clicking the Start the service.

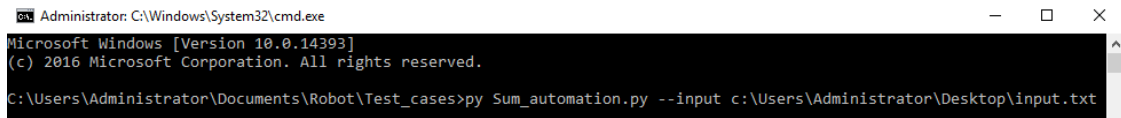
## Visual Studio Code: (Optional)

- Download VS code from this link and install it <https://code.visualstudio.com/download> .
- Add extension "Robot Framework Intellisense"
- Make sure that all the files that are created must be in same directory

# Flow of Execution

## Script to be run by user:

- `Sum_Automation.py` py file that need to run along with a parameter to skip the user interface.



```
Administrator: C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator\Documents\Robot\Test_cases>py Sum_automation.py --input c:\Users\Administrator\Desktop\input.txt
```

## 1. Required Parameters are provided:

### 1. For performing only prerequisites:

```
py Sum_automation.py --prerequisite_only --input
<input_file_dir/input_file_name.txt>
```

Prerequisites involves:

- Clearing iLO repository.
- Uninstallation of OFED from Linux machine.
- Rebooting the machine.

### 2. For running the entire script along with prerequisites:

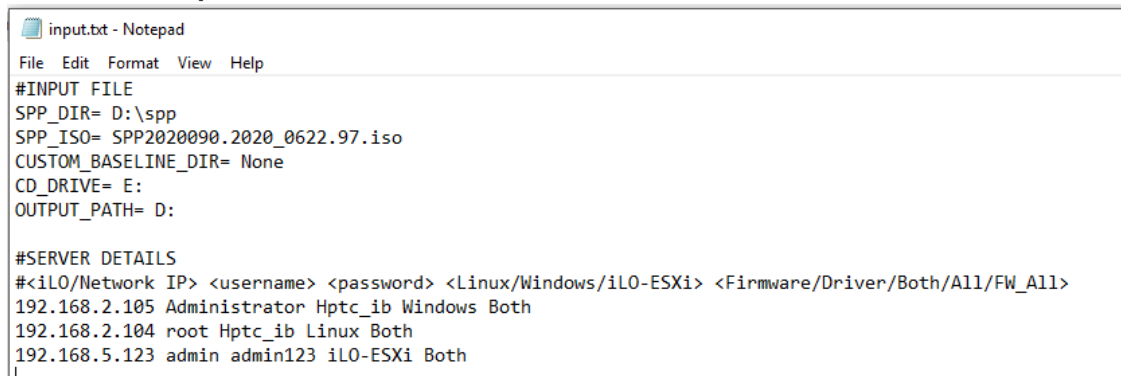
```
py Sum_automation.py --prerequisite --input
<input_file_dir/input_file_name.txt>
```

### 3. For execution of the automation script only:

```
py Sum_automation.py --input <input_file_dir/input_file_name.txt>*
```

## Input File Format:

- User has to edit an input file before running the script in this mode.
- If there is no new entry to the text file, then the script will continue with the old data.
- If there is no data given in the input file, then the script would terminate immediately.
- **The required template is provided within the text file itself and user must strictly follow the template.**



```
input.txt - Notepad
File Edit Format View Help
#INPUT FILE
SPP_DIR= D:\spp
SPP_ISO= SPP2020090.2020_0622.97.iso
CUSTOM_BASELINE_DIR= None
CD_DRIVE= E:
OUTPUT_PATH= D:

#SERVER DETAILS
#<iLO/Network IP> <username> <password> <Linux/Windows/iLO-ESXi> <Firmware/Driver/Both/All/FW_All>
192.168.2.105 Administrator Hptc_ib Windows Both
192.168.2.104 root Hptc_ib Linux Both
192.168.5.123 admin admin123 iLO-ESXi Both
```

- SPP\_ISO= requires spp name as the input.
- SPP\_DIR= requires the directory where the spp is stored.
- CD\_DRIVE= requires name of the drive where spp will mount.
- CUSTOM\_BASELINE\_DIR= path where the custom baseline is stored. If there are no custom baseline then mention None

- OUTPUT\_PATH= path where the logs are collected.

Note:(Enter the details as thown in the example with no extra backward slashes.

- User can comment line with "#". Commented server will not be considered.

```
input.txt - Notepad
File Edit Format View Help
#INPUT FILE
SPP_DIR= D:\spp
SPP_ISO= SPP2020090.2020_0622.97.iso
CUSTOM_BASELINE_DIR= None
CD_DRIVE= E:
OUTPUT_PATH= D:

#SERVER DETAILS
#<iLO/Network IP> <username> <password> <Linux/Windows/iLO-ESXi> <Firmware/Driver/Both/All/FW_All>
192.168.2.105 Administrator Hptc_ib Windows Both
192.168.2.104 root Hptc_ib Linux Both
#192.168.5.123 admin admin123 iLO-ESXi Both
```

## 2. No parameters are provided:

User interface will pop-up.

```
Administrator: C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator\Documents\Robot\Test_cases>py Sum_automation.py
```

**ENTER THE REQUIRED INFORMATION**

Select SPP iso

Select custom baseline

CD drive name:

Select Output Path

Add Server	IP Address	Username	Password	OS Type	Component
Server1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Windows"/>	<input type="button" value="Firmware"/>
Server2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Windows"/>	<input type="button" value="Firmware"/>
Server3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Windows"/>	<input type="button" value="Firmware"/>

- User has to fill all the required fields.
- Selection of spp.iso, output path and giving the cd-drive name is must. **(provide only cd drive name without colon and backward slash. Ex: CD Drive Name = E)**
- Also minimum of one server details must be provided before submitting.
- If user doesn't want to enter any details then he can close the interface. Script would continue with the previously present data of the input file.

## Ping and SSH on to the server:

- All the servers would be pinged and checked for the reachability.
- If the server is reachable then ssh is done with the credentials provided.
- If both the criteria is cleared then only that particular server would be considered as a valid node. The failed ones would be discarded.

## Removal of logs:

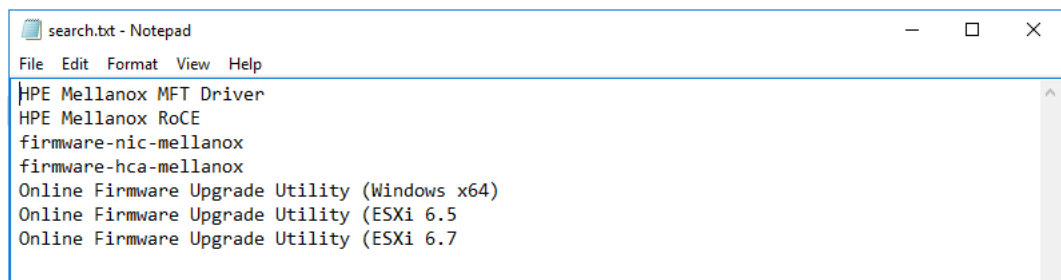
- Logs from the Localhost is removed even before launching the sum station.
- Logs from the remote node is removed during the ssh test.

## Launching of SUM\_Station:

- Firefox browser must be made as a default web browser.
- `launch_sum.bat` will be launched.
- If there is any problem with loading a web page or internet connection, script automatically re-launches the launch\_sum.bat file.
- Baseline addition will be checked. If not added script would add it.
- If custom baseline is provided then it will also be added.
- First node in the list would be added.
- Inventory -> Components are selected -> Deploy

### Selection of components:

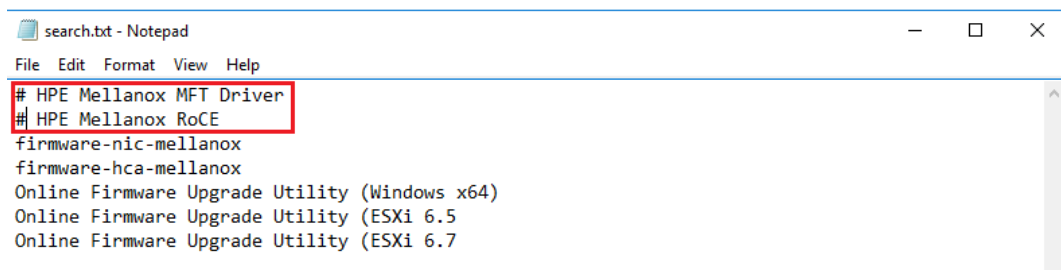
- User should mention whether firmware/driver/Both/All components that needs to be deployed.
- User should also edit `Text_files/search.txt` file.



```
search.txt - Notepad
File Edit Format View Help
HPE Mellanox MFT Driver
HPE Mellanox RoCE
firmware-nic-mellanox
firmware-hca-mellanox
Online Firmware Upgrade Utility (Windows x64)
Online Firmware Upgrade Utility (ESXi 6.5)
Online Firmware Upgrade Utility (ESXi 6.7)
```

**This text file consists of necessary keywords required for the selection of required components. These keywords would be searched for a match against the list of components during the deployment**

- If the user does not want any particular key word not to be searched fro in the components list,then he can comment that line by inserting "**# followed by a space**"



```
search.txt - Notepad
File Edit Format View Help
# HPE Mellanox MFT Driver
# HPE Mellanox RoCE
firmware-nic-mellanox
firmware-hca-mellanox
Online Firmware Upgrade Utility (Windows x64)
Online Firmware Upgrade Utility (ESXi 6.5)
Online Firmware Upgrade Utility (ESXi 6.7)
```

## Gathering Logs:

- Once the deployment is finished successfully, output logs of each component is collected.
- The logs are store in  
`OUTPUT_PATH\spp_name\output_logs\ip_address\component_name.txt`



- Overall result of the node will be stored in `OUTPUT_PATH\spp_name\output_logs\ip_address\result.txt`
- After the execution of entire process, **Dashboard** would appear containing details of every node and its result.

Dashboard		
IP_Address	Component	Status
192.168.2.133	-	Failed_to_login_to_the_system(SSH_Failed)
192.168.2.125	FIRMWARE-NIC-MELLANOX-IB-CX4-CX5-1.0.5-1.1.X86_64	Success.
192.168.2.125	FIRMWARE-NIC-MELLANOX-ETHERNET-ONLY-1.0.12-1.1.X86_64	Success.
192.168.2.125	FIRMWARE-HCA-MELLANOX-VPI-CONNECTX4-1.0.8-1.1.X86_64	Success.
192.168.2.131	MLNX-OFA_KERNEL-4.7-OFED.4.7.3.2.9.1.G457F064.SLES15SP1.X86_64	Update returned error
192.168.2.131	MLNX-OFA_KERNEL-KMP-DEFAULT-4.7_K4.12.14_195-OFED.4.7.3.2.9.1.G457F064.SLES15SP1.X86_64	Update returned error
192.168.2.131	KERNEL-MFT-MLNX-KMP-DEFAULT-4.13.0_K4.12.14_195-1.SLES15SP1.X86_64	Success.
192.168.2.131	MFT-4.13.0-102.SLES15SP1.X86_64	Success.

- User can directly view the log of each component from the dashboard.

Dashboard		
IP_Address	Component	Status
192.168.2.133	-	Failed_to_login_to_the_system(SSH_Failed)
192.168.2.125	FIRMWARE-NIC-MELLANOX-IB-CX4-CX5-1.0.5-1.1.X86_64	Success.
192.168.2.125	FIRMWARE-NIC-MELLANOX-ETHERNET-ONLY-1.0.12-1.1.X86_64	Success.
192.168.2.125	FIRMWARE-HCA-MELLANOX-VPI-CONNECTX4-1.0.8-1.1.X86_64	Success.
192.168.2.131	MLNX-OFA_KERNEL-4.7-OFED.4.7.3.2.9.1.G457F064.SLES15SP1.X86_64	Update returned error
192.168.2.131	MLNX-OFA_KERNEL-KMP-DEFAULT-4.7_K4.12.14_195-OFED.4.7.3.2.9.1.G457F064.SLES15SP1.X86_64	Update returned error
192.168.2.131	KERNEL-MFT-MLNX-KMP-DEFAULT-4.13.0_K4.12.14_195-1.SLES15SP1.X86_64	Success.
192.168.2.131	MFT-4.13.0-102.SLES15SP1.X86_64	Success.

- Zip file SUM\_SUT\_Logs.zip is also collected in `OUTPUT_PATH\spp_name\output_logs\ip_address\`

gather_logs	3/12/2020 1:09 AM	File folder	
error.txt	3/12/2020 12:44 AM	Text Document	0 KB
FIRMWARE-HCA-MELLANOX-VPI-CON...	3/12/2020 1:09 AM	Text Document	2 KB
FIRMWARE-NIC-MELLANOX-ETHERNET...	3/12/2020 1:09 AM	Text Document	2 KB
FIRMWARE-NIC-MELLANOX-IB-CX4-CX...	3/12/2020 1:09 AM	Text Document	2 KB
result.txt	3/12/2020 1:09 AM	Text Document	1 KB
SUM_SUT_Logs_03-12-2020_01-09-29.zip	3/12/2020 1:09 AM	Compressed (zipp...	9,317 KB