

Robot Framework Introduction

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2022/5/10

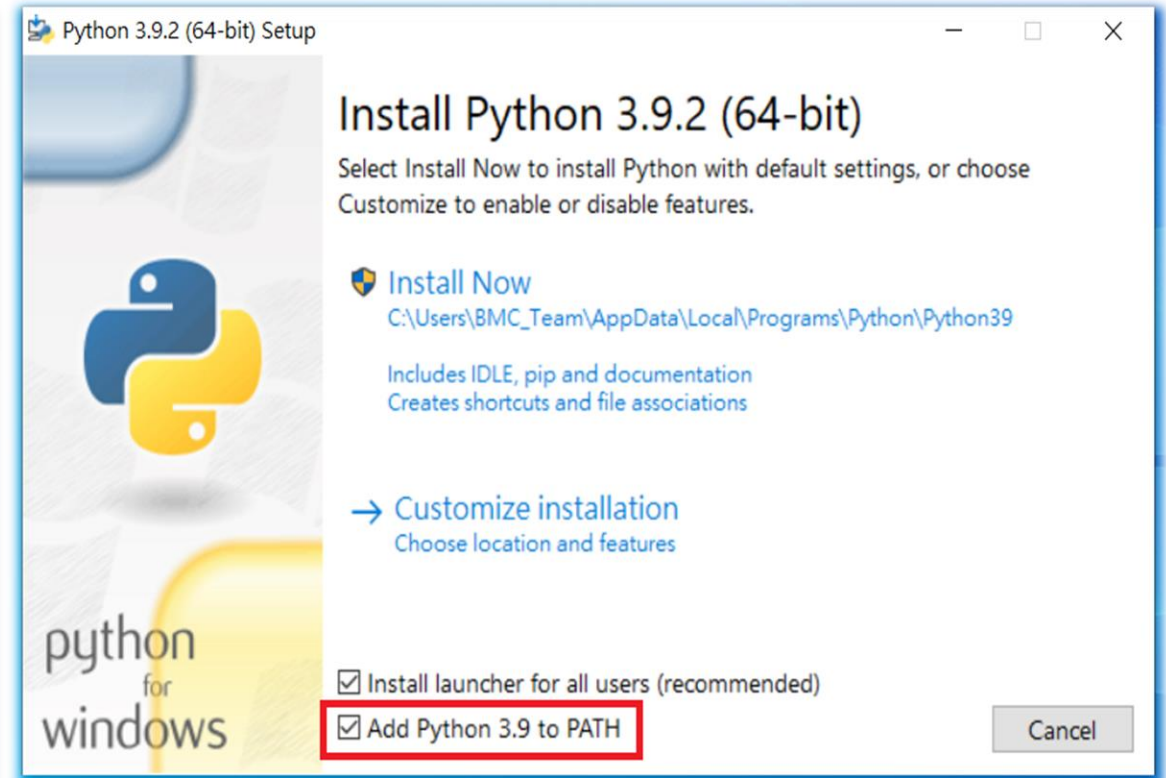
Agenda

- VS Code & Python Installation
- Robot Framework & Extensions Installation
- Robot Framework Introduction
- Automation Tool Introduction
- Demo

Python – Robot Framework

VS code & Python Installation

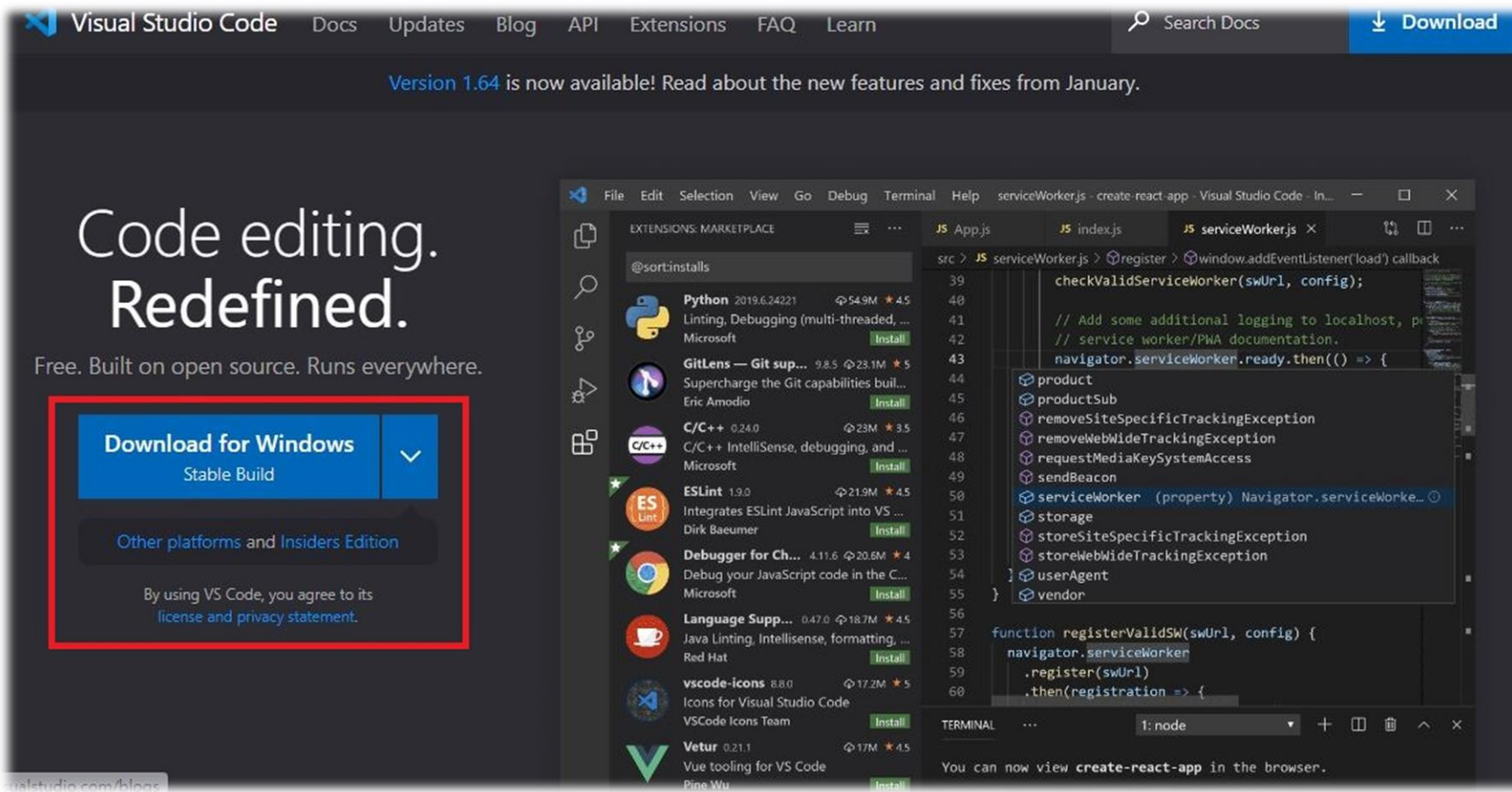
Download : <https://www.python.org/downloads/>



Python – Robot Framework

VS code & Python Installation

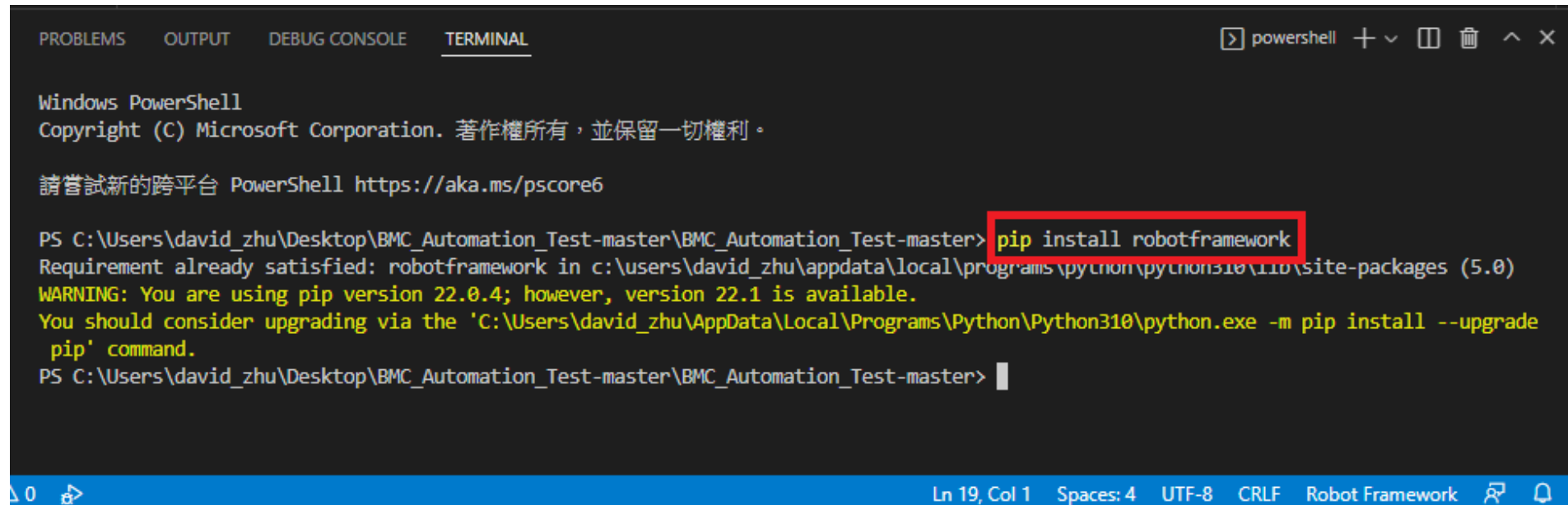
Download : <https://code.visualstudio.com/>



Python – Robot Framework

Robot Framework Installation

```
$ pip install robotframework
```



The screenshot shows a Windows PowerShell terminal window with the following content:

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL powershell + - [ ] [ ] ^ X

Windows PowerShell
Copyright (C) Microsoft Corporation. 著作權所有，並保留一切權利。

請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

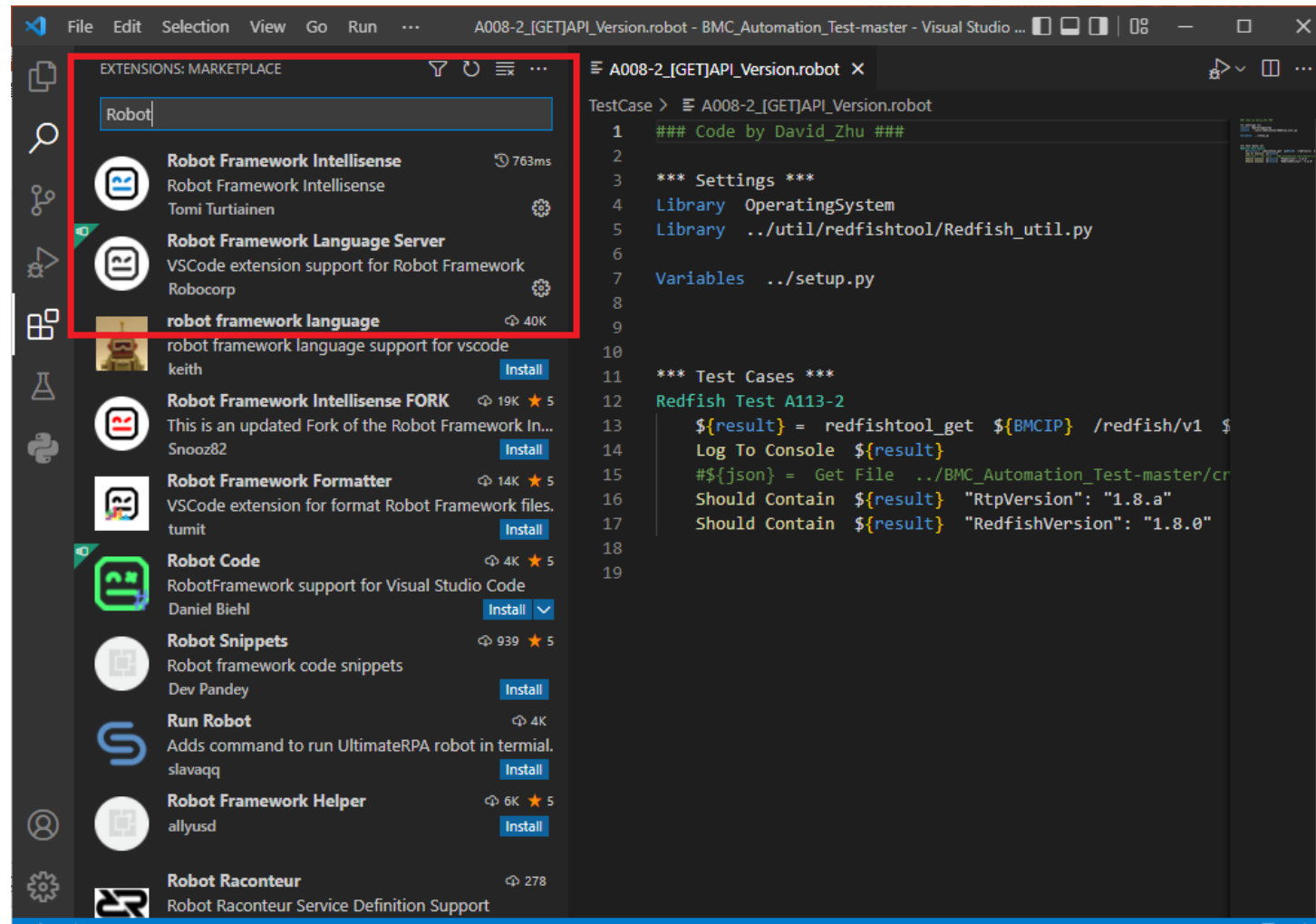
PS C:\Users\david_zhu\Desktop\BMC_Automation_Test-master\BMC_Automation_Test-master> pip install robotframework
Requirement already satisfied: robotframework in c:\users\david_zhu\appdata\local\programs\python\python310\lib\site-packages (5.0)
WARNING: You are using pip version 22.0.4; however, version 22.1 is available.
You should consider upgrading via the 'C:\Users\david_zhu\AppData\Local\Programs\Python\Python310\python.exe -m pip install --upgrade pip' command.
PS C:\Users\david_zhu\Desktop\BMC_Automation_Test-master\BMC_Automation_Test-master>
```

The command `pip install robotframework` is highlighted with a red box. The terminal output indicates that the requirement is already satisfied and provides a warning about upgrading pip.

Ln 19, Col 1 Spaces: 4 UTF-8 CRLF Robot Framework

Python – Robot Framework

Robot Framework Extensions Installation



Python – Robot Framework

Robot Framework

- Base on Python Language to implement.
- Robot Framework program grammar easy for automation used.
- Robot Framework have below function.
 - ✓ Automation test report creation
 - ✓ Automation test case execution
 - ✓ Pass / Fail result determination

Python – Robot Framework

Robot Framework Format

*** Settings ***

| | |
|----------------------|-------|
| <u>Library</u> | value |
| <u>Resource</u> | value |
| <u>Variables</u> | value |
| <u>Suit Setup</u> | value |
| <u>Suit Teardown</u> | value |

*** Variable ***

`${Var}` value

*** Keyword ***

| | |
|---------------|--------|
| Function_Name | Action |
|---------------|--------|

*** Test Case ***

| | |
|-----------|-------------|
| Test_Case | Step_Action |
|-----------|-------------|

Python – Robot Framework

Robot Framework (Settings block)

- ✓ Used for package import
- ✓ Keyword
 - Library : Import python package
 - Resource : Import robot package
 - Suit Setup : Execute the test preliminary work before test
 - Suit Teardown : Recovery the setting after test

| Settings | Value | Value | Value |
|---------------|---|-------|-------|
| Library | ../util/ipmitool/IPMI_util.py | | |
| Resource | ../util/ipmitool/IPMI_Power_Control.robot | | |
| Variables | ../setup.py | | |
| Suit Setup | Launch Browser and Login GUI | | |
| Suit Teardown | Close Browser | | |

Python – Robot Framework

Robot Framework (Variable block)

- ✓ Used for variable declare.
- ✓ Variable can be named by user.
- ✓ Used `${}` format to define variable name.

| Variable | Value | Value |
|--|---|-------|
| <code>\${xpath_hardware_status_heading}</code> | <code>//*[@id="main"]/div/div/aside[1]/div/section/ul/li[11]/a</code> | |
| <code>\${BMCWeb}</code> | <code>https://\${BMCIP}</code> | |

Python – Robot Framework

Robot Framework (Keyword block)

- ✓ Function declare for used.
- ✓ Function can be named by user.
- ✓ Used Robot Framework Keyword [Arguments] to define function arguments.

| Keyword | Action | Argument | Argument | Argument | Argument | Argument | Argument |
|------------------|----------------|------------|----------|------------|--------------|-----------|------------------|
| Chassis Power On | [Arguments] | (Optional) | | | | | |
| | \${result} = | ipmicmd | lanplus | \${USERID} | \${PASSWORD} | \${BMCIP} | chassis power on |
| | Log To Console | \${result} | | | | | |
| | Should Contain | \${result} | Up/On | | | | |
| | | | | | | | |

Python – Robot Framework

Robot Framework - In common use Keyword

- ✓ Run Keyword and Return Status
- ✓ Wait Until Page Contains Element
- ✓ Should Be Equal
- ✓ Set Test Variable
- ✓ Run Keyword If
- ✓ Click Element
- ✓ Double Click Element
- ✓ Sleep
- ✓ Element Attribute Should Contain Text

Python – Robot Framework

Robot Framework (Test Case block)

- ✓ Test Case step defined.
- ✓ Test Case check point defined.
- ✓ Test Case step can call Function (Keyword) what you want to test.
- ✓ Used Robot Framework Keyword [**Documentation**] to define test description

| Test Case | Action | Argument | Argument |
|------------------------------------|-------------------------------|--|----------|
| BMC Web Power Off Server Immediate | [Documentation] | Verify BMC Power Control From WebUI | |
| | Wait Until Element Is Visible | //*[@id="main"]/div/header/label | |
| | Click Element | //*[@id="main"]/div/div/aside[1]/div/section/ul/li[11]/a | |
| | Sleep | \${OSDelay} | |
| | Capture Page Screenshot | | |
| | | | |

Python – Robot Framework

Robot Framework – Redfish PATCH Test

```
C: > Users > david_zhu > Desktop > BMC_Automation_Test-master > BMC_Automation_Test-master > redfish > A008-12_[PATCH]Computer_System.robot
1  ### Code by David_Zhu ###
2
3  *** Settings ***
4  Library  OperatingSystem
5  Library  Collections
6  Library  ../util/redfishtool/Redfish_util.py
7  Variables  ../setup.py
8
9
10 *** Test Cases ***
11 Redfish Test A008-12
12     ${json} = Get File  ../BMC_Automation_Test-master/criteria/redfish/A008-12.json
13     Log To Console  ${json}
14     ${dict} = json_to_dict  ${json}
15
16     ${result} = redfishtool_patch  ${BMCIP} /redfish/v1/Systems/Self  ${USERID}  ${PASSWORD}  ${dict}
17     Log To Console  ${result}
18     Should Be Equal  "${result}"  "204"
19
20     #Should Be Equal  ${json}  ${result}
21     #Should Not Be Empty  ${result}
22
23     ${result} = redfishtool_get  ${BMCIP} /redfish/v1/Systems/Self  ${USERID}  ${PASSWORD}
24     Should Contain  ${result}  "IndicatorLED": "Blinking"
25     Should Contain  ${result}  "PowerRestorePolicy": "AlwaysOn"
26
27
28
29
```

Settings : Used to Import the python package or other Robot script witch need to used.

Test Cases : Used to design the test step of the test target, it can be assigned the multiple test case to do the sequential test.

Redfish Function test : Call Redfish function to do the PATCH test, used Robot Framework Keyword "Should Be Equal " to compare the response.

Python – Robot Framework

Robot Framework- Web UI Test

```
C: > Users > david_zhu > Desktop > BMC_Automation_Test-master > BMC_Automation_Test-master > gui > BMC_Web_Power_Control.robot > ...  
1  ### robot_test_keywords.robot ###  
2  
3  *** Settings ***  
4  Library  OperatingSystem  
5  Library  Selenium2Library  
6  Library  ../util/ipmitool/IPMI_util.py  
7  Resource ../util/ipmitool/IPMI_Power_Control.robot  
8  Resource ../util/gui/BMC_Web_Login.robot  
9  
10 Variables ../setup.py  
11 Suite Teardown  Close Browser  
12  
13 *** Test Cases ***  
14 BMC Web Power Off Server Immediate  
15     BMC Web Login  
16     Wait Until Element Is Visible  /*[@id="main"]/div/header/label  
17     Click Element  /*[@id="main"]/div/div/aside[1]/div/section/ul/li[11]/a  
18  
19     Wait Until Element Is Visible  /*[@id="main"]/div/div/aside[2]/div/section[1]/h1  
20     Click Element  /*[@id="main"]/div/div/aside[2]/div/section[2]/div/div/div[2]/form/div[1]/label/div/ins  
21     Click Element  /*[@id="save"]  
22     Handle Alert  
23  
24     Sleep  ${OSDelay}  
25  
26     ${result} = ipmicmd lanplus ${USERID} ${PASSWORD} ${BMCIP} chassis power status  
27     Log To Console  ${result}  
28     Should Contain  ${result}  off  
29  
30     Capture Page Screenshot  
31     Close Browser  
32
```

Variables : Used for variable declare, If test on WebUI, it can used to declare the WebUI source code. (Press F12 to get the Web item Xpath)

WebUI Control : Base on Selenium2 Framework and used Robot Framework Keyword "Click Element" control WebUI to click items.

WebUI Test : After WebUI Test finished, can used Robot Framework Keyword "Capture Page Screenshot" to capture the Web page and then Close the Browser

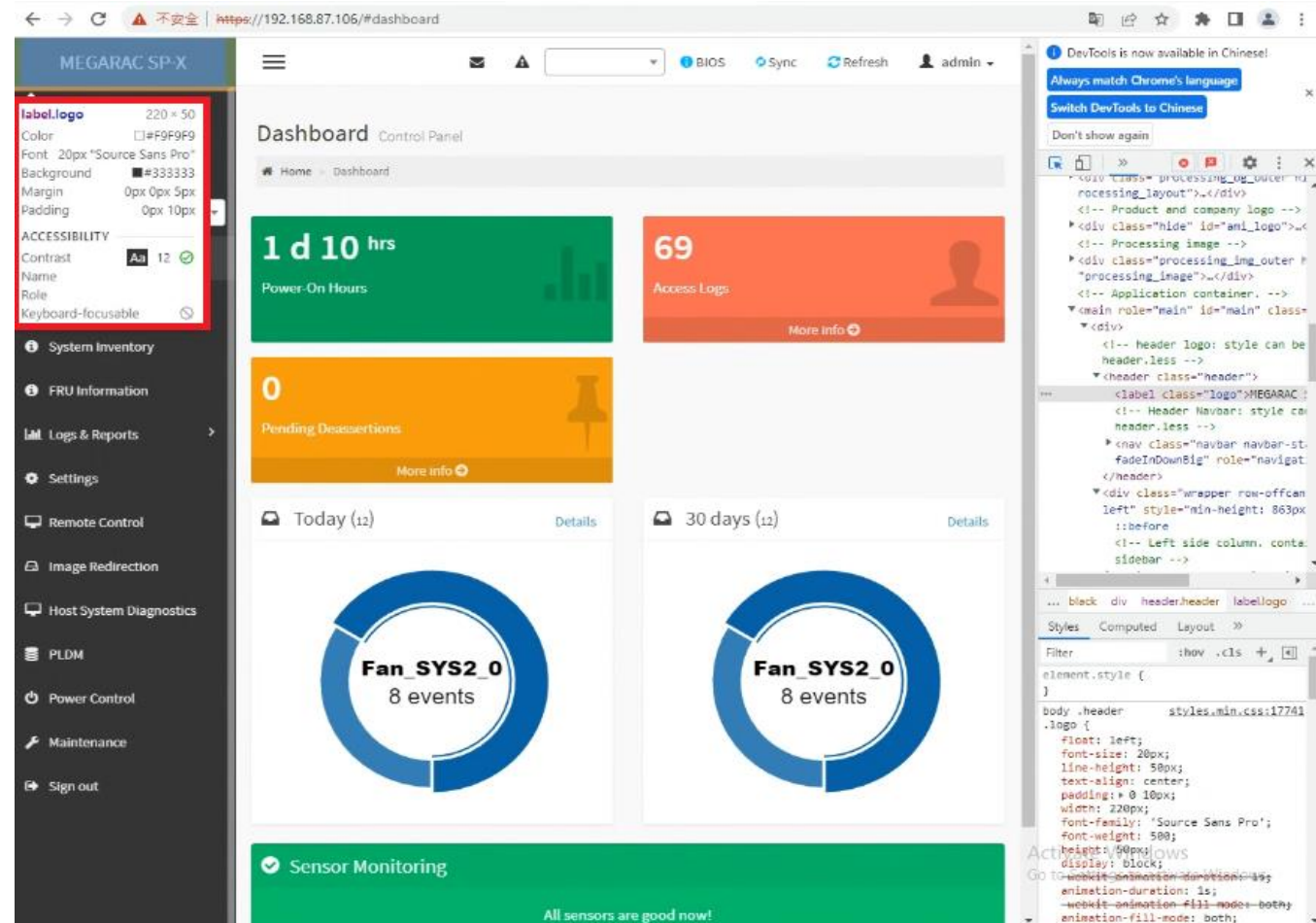
Python – Robot Framework

Selenium Framework- Web UI Control

Web Source code : Press F12 to get the Web item Xpath, *Selenium framework* need to get the web item Xpath and depend on WebDriver to control the web.

Chrome : Chrome Driver

Firefox : Gecko Driver



Automation Tool Introduction

Automation Tool Introduction

Automation Related Technical

- Environment requirement as below
 - Windows OS
 - Python 3
 - Robot Framework
 - ✓ For automation test and test report creation
 - Ipmitool
 - ✓ For IPMI command used
 - Redfishtool
 - ✓ For REST method GET / POST / PATCH / DEL used
 - Selenium2Library
 - ✓ For Web GUI automation test control (Web motion control)

Automation Tool Introduction

Automation Tool Environment Setting

- The newest python installation.
- Need to execute "pip install -r requirements.txt" at the BMC_Automation_Test folder to install the related python package.
- "BMC_Automation_Test/drivers" folder need to add the environment variable on Windows OS.
- "util" folder need to add the environment variable on Windows OS.
- Google Chrome need to used Version 100.0.4896.127 above.

Automation Tool Introduction

Automation Tool Setup and Run

- Set the related parameter about BMC IP, Username, Password and others on GUI interface.
- Execute the GUIsetup.py by command "Python GUIsetup.py" to launch the GUI interface.
- Execute the command "robot TestCase\\\${TestCaseName}" to used by command line.
- After test finished, you can check the Test report under the "BMC_Automation_Test" folder.
- This tool can test BMC function which TestCase you add in the TestCase folder.

Automation Tool Introduction

Automation Tool Architecture

Criteria Define

Web Driver

Test Case Define

Related Tool

GUI Setup

Test Report

| n_Test-master > BMC_Automation_Test-master | | | | |
|--|--------------------|--------------------|--------|--|
| 名稱 | 修改日期 | 類型 | 大小 | |
| _pycache_ | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| criteria | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| drivers | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| gui | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| image | 2022/6/5 下午 02:21 | 檔案資料夾 | | |
| ipmi | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| redfish | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| TestCase | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| util | 2022/6/3 上午 10:01 | 檔案資料夾 | | |
| GUIsetup.py | 2022/6/7 下午 10:14 | Python 來源檔案 | 7 KB | |
| log.html | 2022/6/2 下午 06:54 | Microsoft Edge ... | 230 KB | |
| output.xml | 2022/6/2 下午 06:54 | XML Document | 18 KB | |
| README.md | 2022/4/26 上午 03:57 | Markdown 來源... | 1 KB | |
| report.html | 2022/6/2 下午 06:54 | Microsoft Edge ... | 230 KB | |
| requirements.txt | 2022/4/26 上午 03:57 | 文字文件 | 1 KB | |
| setup.py | 2022/6/7 下午 09:50 | Python 來源檔案 | 0 KB | |

Automation Tool Introduction

Automation Tool GUI

Test Case Selection

Configure Setup

BMC Connection Check

Start Test

The screenshot shows the ASUS BMC Automation Test Tool interface. It features a tree view on the left for selecting test cases, a central table of selected test cases, and a right-hand configuration panel. Orange arrows point from the labels on the left to specific elements in the GUI: 'Test Case Selection' points to the tree view, 'Configure Setup' points to the 'A008-2' test case in the table, 'BMC Connection Check' points to the 'BMC Connect Success!' status bar, and 'Start Test' points to the 'Start Test' button.

| TestCaseID | TestCase |
|---|---------------------------------|
| WEBUI | |
| <input checked="" type="checkbox"/> TestCase1 | BMC_Web_Login_Test |
| <input type="checkbox"/> TestCase2 | BMC_Web_Power_Control |
| <input type="checkbox"/> TestCase3 | BMC_Web_FWupdate |
| IPMI | |
| <input checked="" type="checkbox"/> TestCase3 | IPMI_Get_Device_ID |
| <input type="checkbox"/> TestCase4 | IPMI_Power_Control_Test |
| Redfish | |
| <input type="checkbox"/> A113-1 | A113-1_[GET]API_Path |
| <input checked="" type="checkbox"/> A008-2 | A008-2_[GET]API_Version |
| <input type="checkbox"/> A113-3 | A113-3_[GET]OData_Service_Docum |
| <input type="checkbox"/> A113-4 | A113-4_[GET]metadata_document |
| <input type="checkbox"/> A113-5 | A113-5_[GET]openapi_yaml |
| <input type="checkbox"/> A113-6 | A113-6_[GET]Service_root |
| <input type="checkbox"/> A113-8 | A113-8_[GET]Computer_System_Col |
| <input type="checkbox"/> A113-9 | A113-9_[POST]Computer_System_Cc |
| <input type="checkbox"/> A008-11 | A008-11_[GET]Computer_System |
| <input type="checkbox"/> A008-12 | A008-12_[PATCH]Computer_System |
| <input type="checkbox"/> A008-13 | A008-13_[PATCH]System_OEM_Prop |
| <input type="checkbox"/> A008-14 | A008-14_[POST]Computer_System |

BMC IP
192.168.0.121

UserID
admin

Password
admin123

Default Password
admin

OS IP
192.168.0.100

OS Delay Time(s)
180

FW File Path
p:\ROM file\rom_tty\USB0(RS700).ima

FW Version
1.2.14

Save

BMC Connect Success!

Link Check

Start Test

Automation Tool Introduction

Automation Tool Test Run

The screenshot displays the ASUS BMC Automation Test Tool interface, which is divided into three main sections: a command prompt on the left, a test case selection table in the center, and a configuration panel on the right.

Command Prompt (Left): Shows the execution of the GUI setup script. It reports a failure for 'Getting Default Adapter' and a successful login for 'BMC Web Login Test & IPMI Get Device ID & A008-2 [GET]API Version'. It also displays a large JSON response for the 'Redfish Test A113-2'.

Test Case Selection Table (Center):

| Test Case ID | Test Case |
|---|---------------------------------|
| WEBUI | |
| <input checked="" type="checkbox"/> TestCase1 | BMC_Web_Login_Test |
| <input type="checkbox"/> TestCase2 | BMC_Web_Power_Control |
| <input type="checkbox"/> TestCase3 | BMC_Web_FWUpdate |
| IPMI | |
| <input checked="" type="checkbox"/> TestCase3 | IPMI_Get_Device_ID |
| <input type="checkbox"/> TestCase4 | IPMI_Power_Control_Test |
| Redfish | |
| <input type="checkbox"/> A113-1 | A113-1_[GET]API_Path |
| <input checked="" type="checkbox"/> A008-2 | A008-2_[GET]API_Version |
| <input type="checkbox"/> A113-3 | A113-3_[GET]OData_Service_Docum |
| <input type="checkbox"/> A113-4 | A113-4_[GET]metadata_document |
| <input type="checkbox"/> A113-5 | A113-5_[GET]openapi_yaml |
| <input type="checkbox"/> A113-6 | A113-6_[GET]Service_root |
| <input type="checkbox"/> A113-8 | A113-8_[GET]Computer_System_Col |
| <input type="checkbox"/> A113-9 | A113-9_[POST]Computer_System_Cc |
| <input type="checkbox"/> A008-11 | A008-11_[GET]Computer_System |
| <input type="checkbox"/> A008-12 | A008-12_[PATCH]Computer_System |
| <input type="checkbox"/> A008-13 | A008-13_[PATCH]System_OEM_Prop |
| <input type="checkbox"/> A008-14 | A008-14_[POST]Computer_System |

Configuration Panel (Right):

- BMC IP:** 192.168.0.121
- UserID:** admin
- Password:** admin123
- Default Password:** admin
- OS IP:** 192.168.0.100
- OS Delay Time(s):** 180
- FW File Path:** p:\ROM file\rom_ttyUS80(RS700).ima
- FW Version:** 1.2.14

Buttons: Save, BMC Connect Success!, Link Check, Start Test.

Automation Tool Introduction

Automation Tool Test Report

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path Log

Generated
20220513 12:55:40 UTC-07:00
2 minutes 53 seconds ago

REPORT

Test Statistics

| Total Statistics | Total | Pass | Fail | Skip | Elapsed | Pass / Fail / Skip |
|------------------|-------|------|------|------|----------|--------------------|
| All Tests | 3 | 3 | 0 | 0 | 00:00:15 | <div></div> |

| Statistics by Tag | Total | Pass | Fail | Skip | Elapsed | Pass / Fail / Skip |
|-------------------|-------|------|------|------|---------|--------------------|
| No Tags | | | | | | <div></div> |

| Statistics by Suite | Total | Pass | Fail | Skip | Elapsed | Pass / Fail / Skip |
|---|-------|------|------|------|----------|--------------------|
| BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path | 3 | 3 | 0 | 0 | 00:00:18 | <div></div> |
| BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path . BMC Web Login Test | 1 | 1 | 0 | 0 | 00:00:18 | <div></div> |
| BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path . IPMI Get Device ID | 1 | 1 | 0 | 0 | 00:00:00 | <div></div> |
| BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path . A113-1 [GET]API Path | 1 | 1 | 0 | 0 | 00:00:00 | <div></div> |

Test Execution Log

SUITE

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path

00:00:18.163

Full Name:

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path

Start / End / Elapsed:

20220513 12:55:22.279 / 20220513 12:55:40.442 / 00:00:18.163

Status:

3 tests total, 3 passed, 0 failed, 0 skipped

SUITE

BMC Web Login Test

00:00:17.577

Full Name:

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path BMC Web Login Test

Source:

C:\Users\Administrator\Desktop\Test\BMC_Automation_Test-master\TestCase\BMC_Web_Login_Test.robot

Start / End / Elapsed:

20220513 12:55:22.322 / 20220513 12:55:39.899 / 00:00:17.577

Status:

1 test total, 1 passed, 0 failed, 0 skipped

TEARDOWN

Selenium2Library . Close Browser

00:00:02.054

TEST

Login BMC Web Test

00:00:14.852

SUITE

IPMI Get Device ID

00:00:00.124

Full Name:

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path IPMI Get Device ID

Source:

C:\Users\Administrator\Desktop\Test\BMC_Automation_Test-master\TestCase\IPMI_Get_Device_ID.robot

Start / End / Elapsed:

20220513 12:55:39.902 / 20220513 12:55:40.026 / 00:00:00.124

Status:

1 test total, 1 passed, 0 failed, 0 skipped

TEST

Medium Page

00:00:00.414

SUITE

A113-1 [GET]API Path

00:00:00.413

Full Name:

BMC Web Login Test & IPMI Get Device ID & A113-1 [GET]API Path A113-1 [GET]API Path

Activate Windows
Go to Settings to activate Windows

Automation Tool Introduction

Demo

Automation Tool Introduction

Reference

Robot Framework User Guide

<https://robotframework.org/#development>

Python Download

<https://www.python.org/downloads/>

VS Code Download

<https://code.visualstudio.com/>