

Robot Framework Introduction

自動化開發與認證課

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2022/5/10

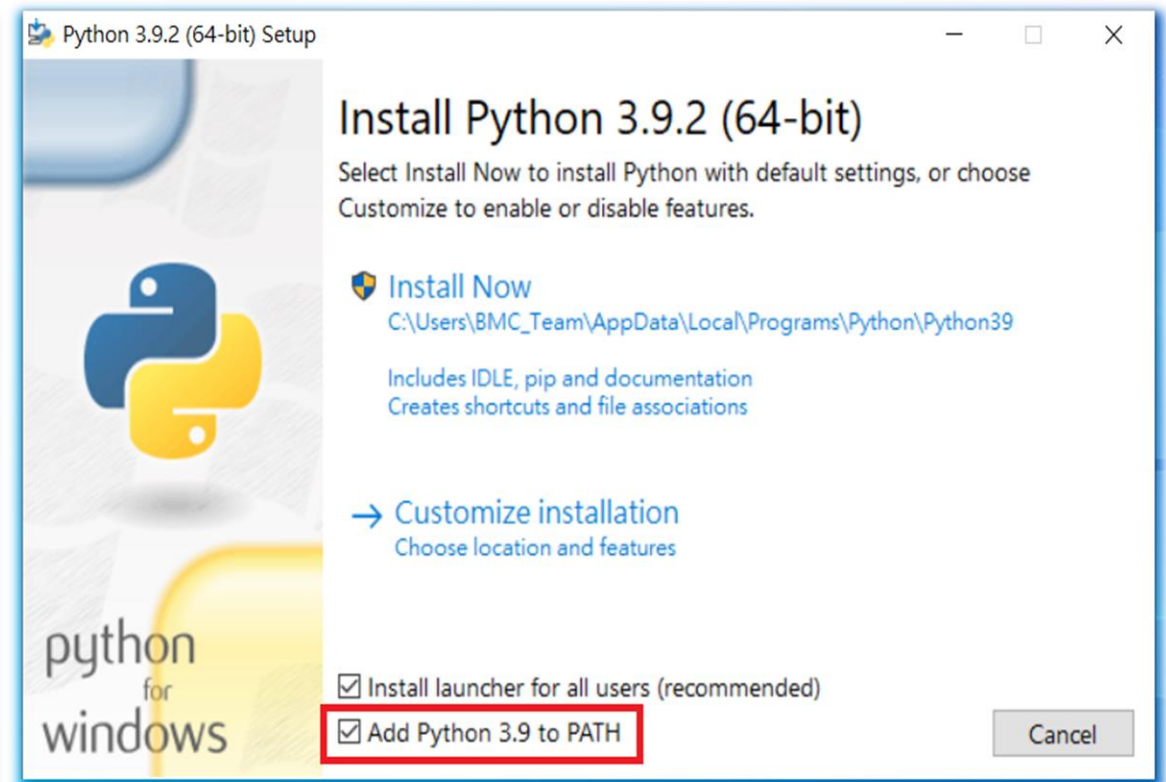
Agenda

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

Python – Robot Framework

VS code & Python Installation

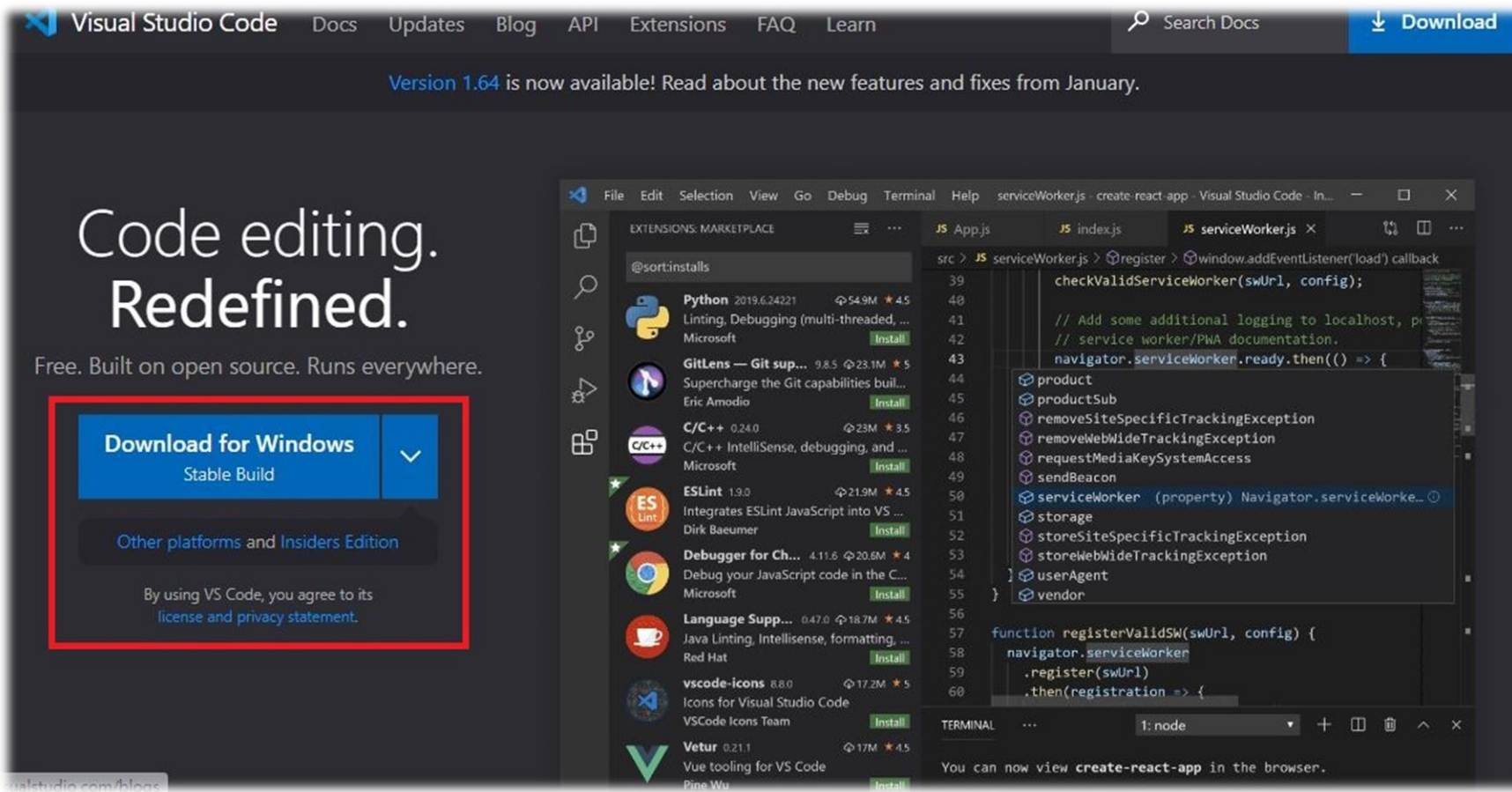
Download : <https://www.python.org/downloads/>



Python – Robot Framework

VS code & Python Installation

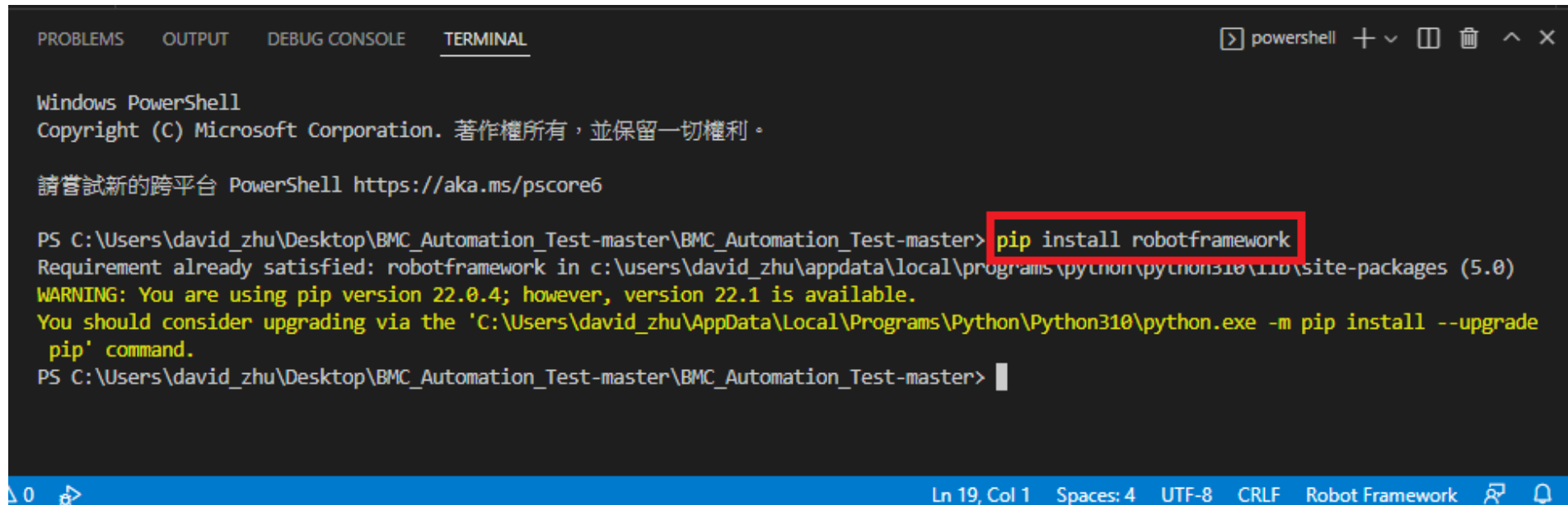
Download : <https://code.visualstudio.com/>



Python – Robot Framework

Robot Framework Installation

```
$ pip install -r requirements.txt
```



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

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

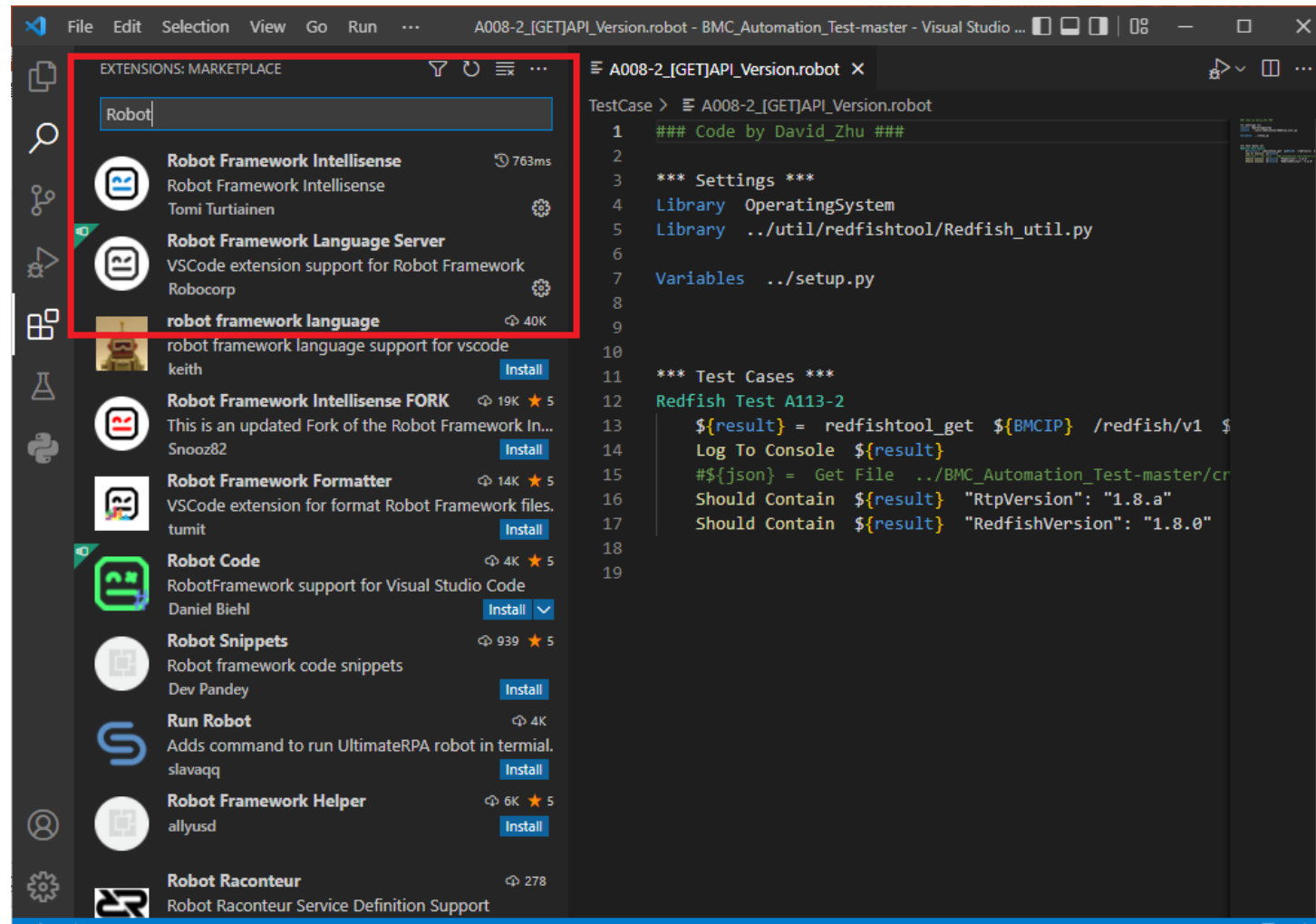
請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

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\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> |
```

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

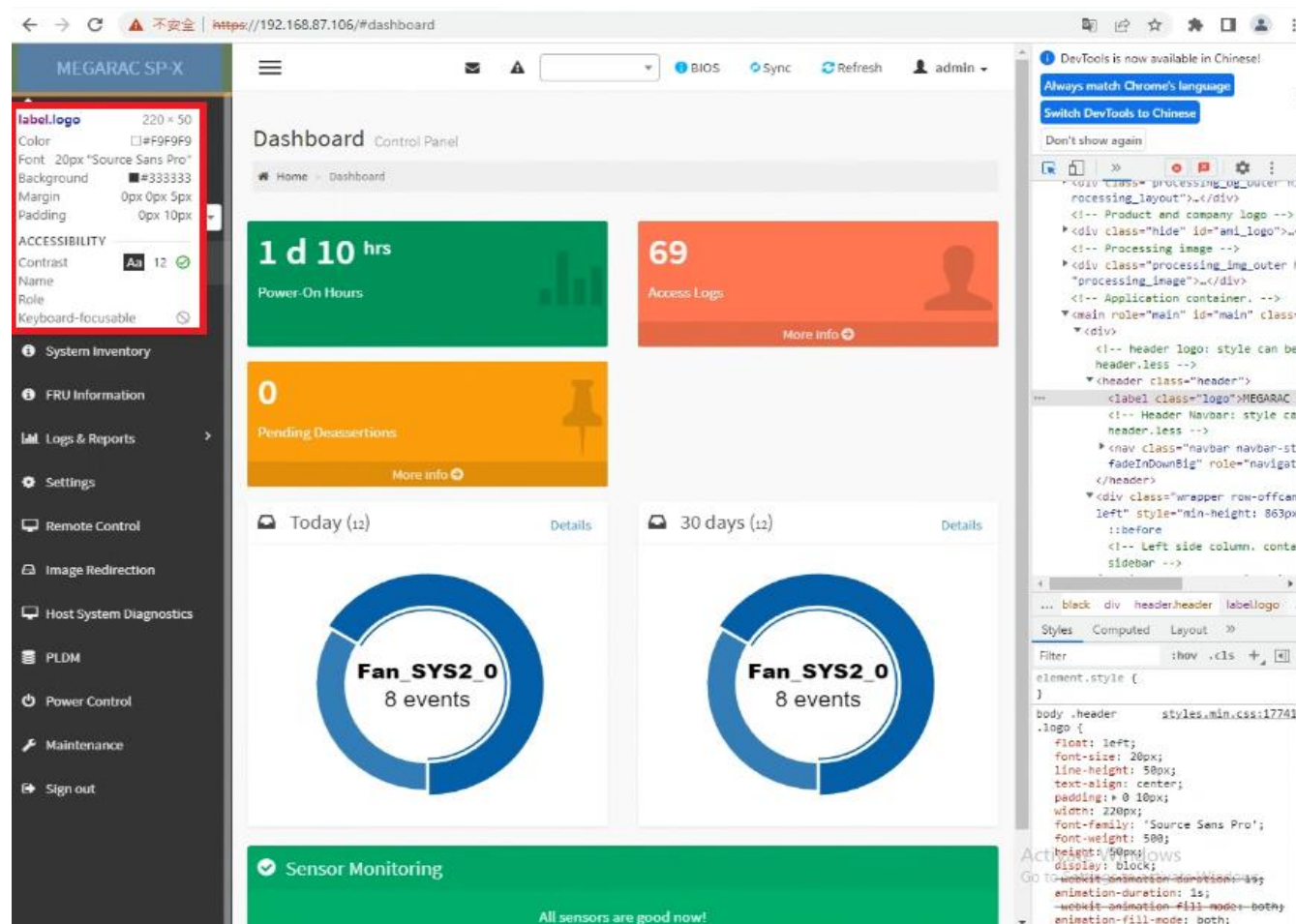
Python – Robot Framework

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 : ChromeDriver

Firefox : FirefoxDriver



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

桌面 > BMC_Automation_Test-master > BMC_Automation_Test-master

名稱	修改日期	類型	大小
pycache	2022/5/10 上午 02:02	檔案資料夾	
criteria	2022/5/10 上午 02:02	檔案資料夾	
drivers	2022/5/10 上午 02:02	檔案資料夾	
gui	2022/5/10 上午 02:02	檔案資料夾	
ipmi	2022/5/10 上午 02:02	檔案資料夾	
redfish	2022/5/10 上午 02:02	檔案資料夾	
TestCase	2022/5/10 上午 02:02	檔案資料夾	
util	2022/5/10 上午 02:02	檔案資料夾	
background.png	2022/4/26 上午 03:57	PNG 檔案	7 KB
corner.ico	2022/4/26 上午 03:57	圖示	164 KB
GUIsetup.py	2022/5/9 上午 10:57	Python 來源檔案	6 KB
log.html	2022/5/9 上午 09:57	Microsoft Edge ...	226 KB
output.xml	2022/5/9 上午 10:33	XML Document	0 KB
README.md	2022/4/26 上午 03:57	Markdown 來源...	1 KB
report.html	2022/5/9 上午 09:57	Microsoft Edge ...	230 KB
requirements.txt	2022/4/26 上午 03:57	文字文件	1 KB
setup.py	2022/5/9 上午 10:50	Python 來源檔案	1 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 is divided into two main sections: a left pane for test case selection and a right pane for configuration and execution.

Test Case Selection (Left Pane):

Test Case ID	TestCase
WEBUI	
<input checked="" type="checkbox"/> TestCase1	BMC_Web_Login_Test
<input type="checkbox"/> TestCase2	BMC_Web_Power_Control
IPMI	
<input checked="" type="checkbox"/> TestCase3	IPMI_Get_Device_ID
<input type="checkbox"/> TestCase4	IPMI_Power_Control_Test
Redfish	
<input checked="" type="checkbox"/> A113-1	A113-1_[GET]API_Path
<input 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_Co
<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_Prof
<input type="checkbox"/> A008-14	A008-14_[POST]Computer_System

Configure Setup (Right Pane):

- BMC IP:** 192.168.0.120
- UserID:** admin
- Password:** admin123
- OS IP:** 192.168.0.110
- OS Delay Time(s):** 180
- Buttons:** Save, BMC Connecting !, Link Check, Start Test (green button)

Four orange arrows point from the text labels on the left to specific elements in the GUI:

- Test Case Selection:** Points to the 'TestCase1' checkbox in the WEBUI section.
- Configure Setup:** Points to the 'A113-1' checkbox in the Redfish section.
- BMC Connection Check:** Points to the 'BMC Connecting !' status indicator.
- Start Test:** Points to the green 'Start Test' button.

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 window on the left, a test case selection table in the center, and a configuration panel on the right.

Command Prompt Window (Left): The window title is "Administrator: C:\Windows\System32\cmd.exe - python GUIsetup.py". It shows the execution of the test tool, including error messages and test results. The output indicates that the Web UI test passed, while the IPMI test failed. The test results are as follows:

Test Case ID	Test Case	Result
Test Case 1	BMC_Web_Login_Test	Passed
Test Case 2	BMC_Web_Power_Control	Passed
Test Case 3	IPMI_Get_Device_ID	Failed
Test Case 4	IPMI_Power_Control_Test	Failed

Test Case Selection Table (Center): This table lists the test cases and their corresponding API paths. The test cases are grouped by protocol: WEBUI, IPMI, and Redfish. The test cases are as follows:

Test Case ID	Test Case
Test Case 1	BMC_Web_Login_Test
Test Case 2	BMC_Web_Power_Control
Test Case 3	IPMI_Get_Device_ID
Test Case 4	IPMI_Power_Control_Test

Configuration Panel (Right): This panel contains fields for configuring the test environment. The fields are: BMC IP (192.168.0.120), UserID (admin), Password (admin123), OS IP (192.168.0.110), and OS Delay Time(s) (180). There are buttons for "Save", "BMC Connecting !", "Link Check", and "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

00:00:00.114

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/>