

# Robot Framework Introduction

**David\_Zhu**

**2022/5/10**

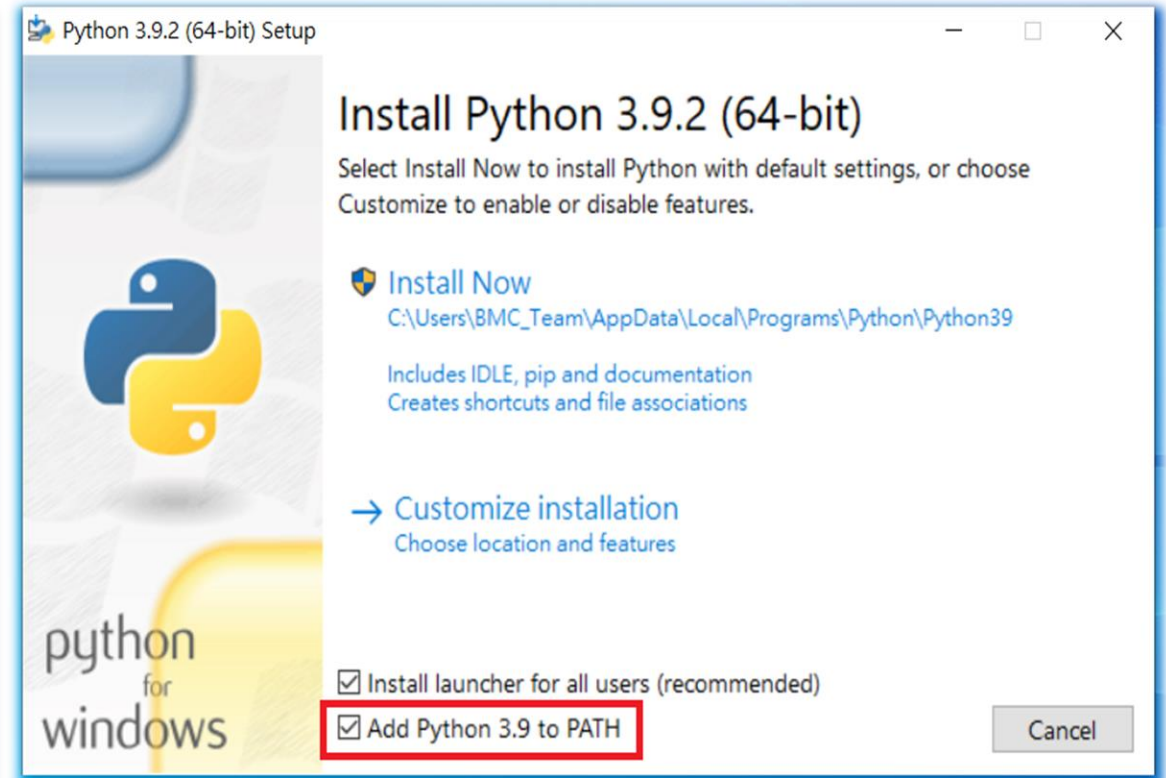
# Agenda

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

# Python – Robot Framework

## VS code & Python Installation

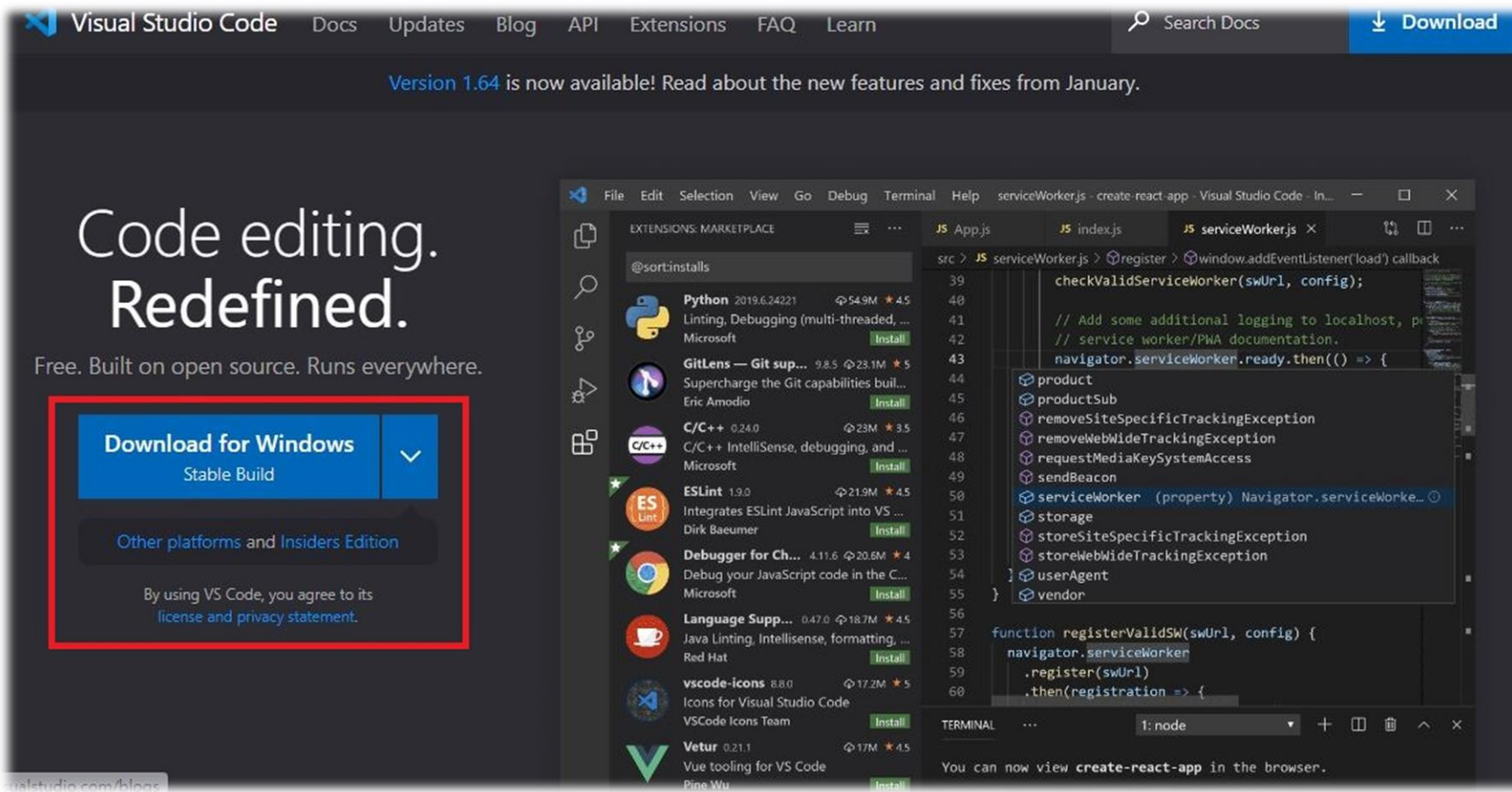
Download : <https://www.python.org/downloads/>



# Python – Robot Framework

## VS code & Python Installation

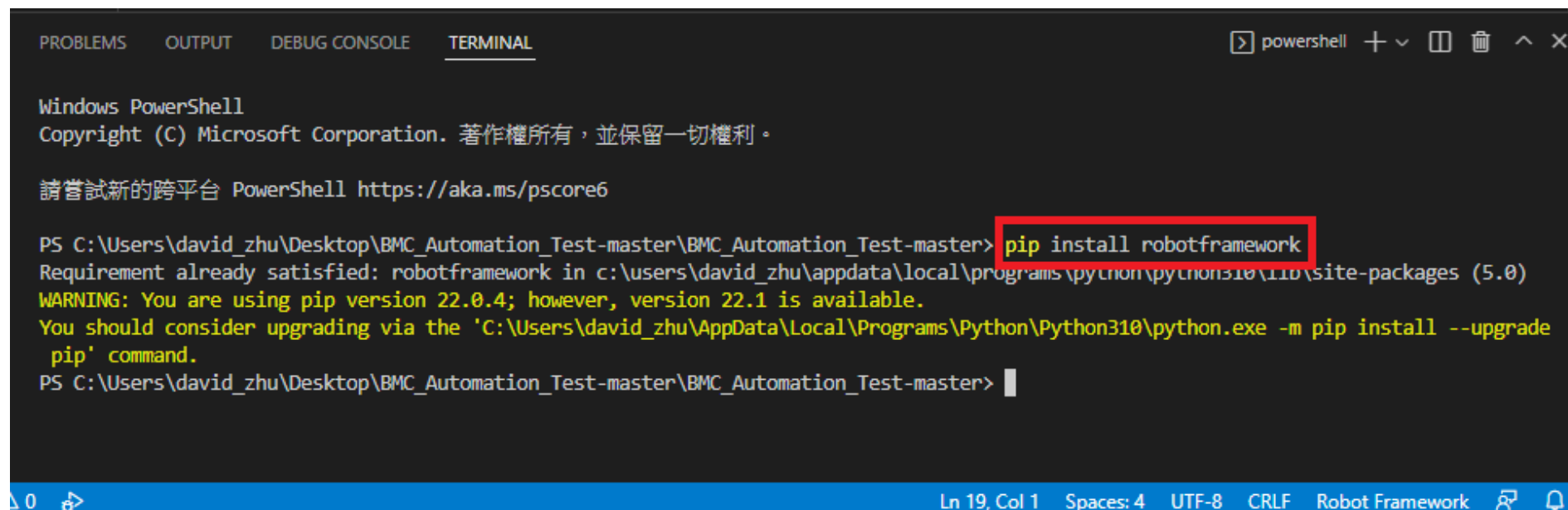
Download : <https://code.visualstudio.com/>



# Python – Robot Framework

## Robot Framework Installation

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



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

```
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。

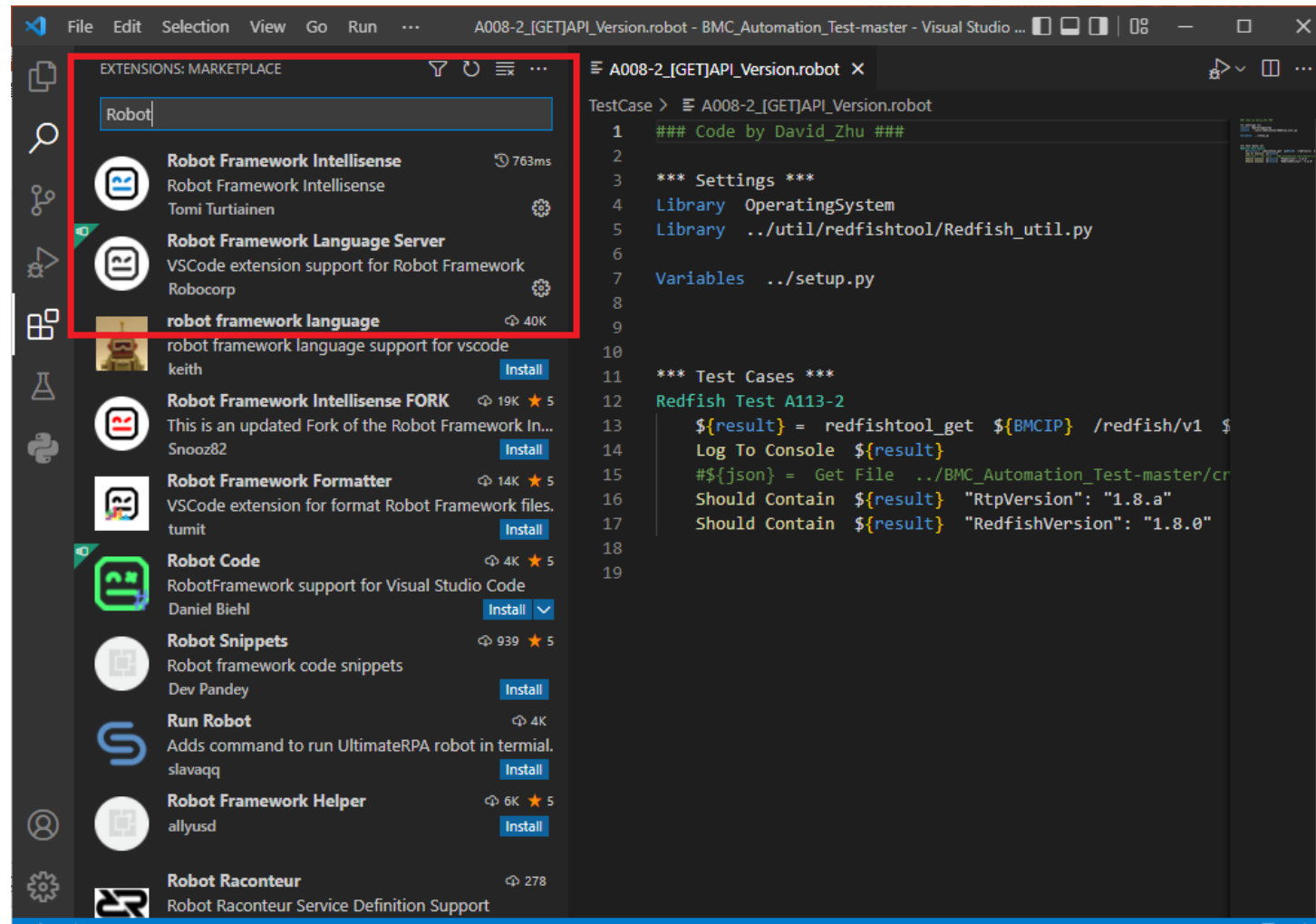
請嘗試新的跨平台 PowerShell https://aka.ms/pscore6

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\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 status bar at the bottom indicates: 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

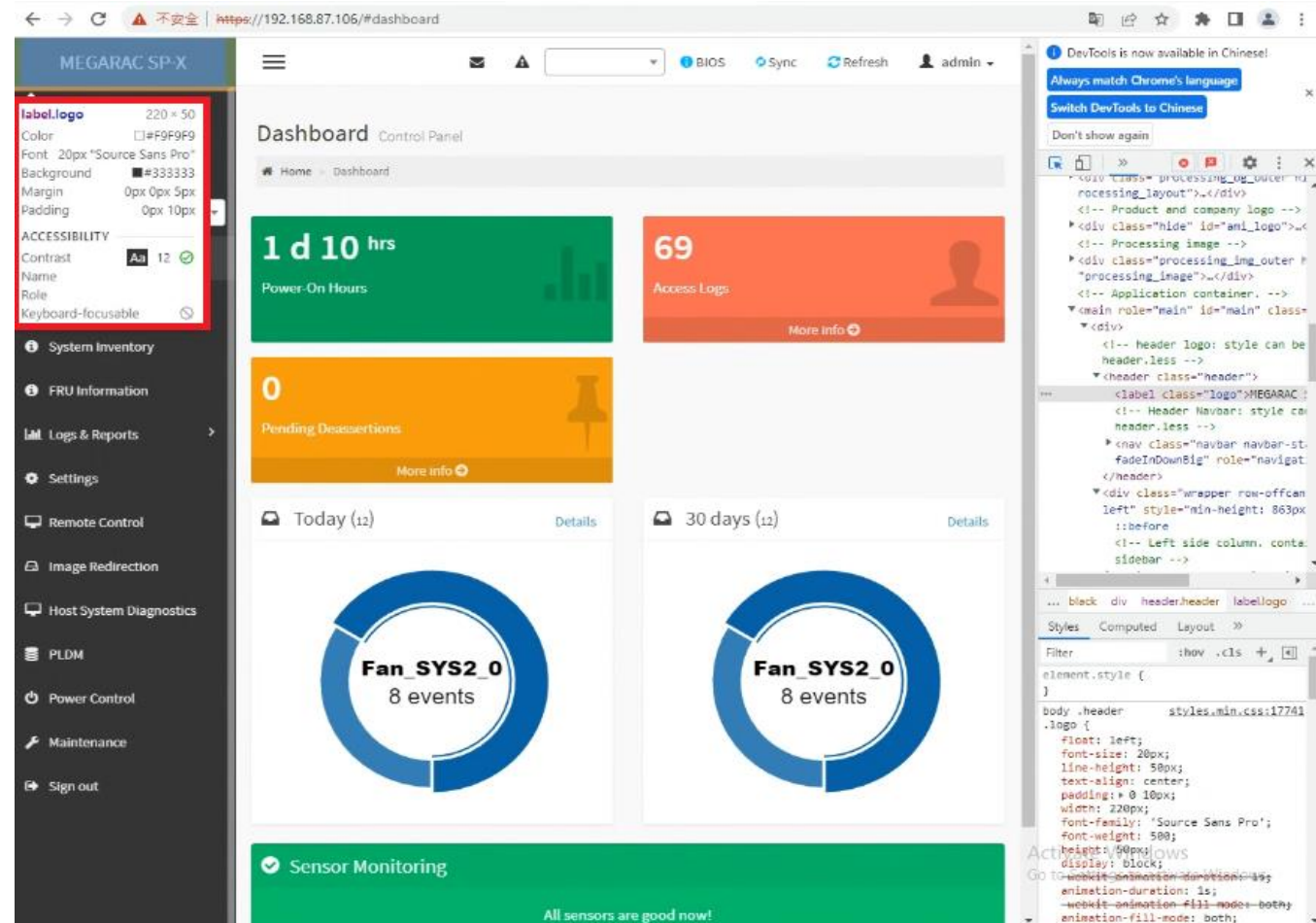
# Python – Robot Framework

## 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 for the selected test cases, and a right-hand panel for configuration and execution. Orange arrows point from the labels on the left to specific elements in the GUI.

TestCaseID	TestCase
<b>WEBUI</b>	
<input checked="" type="checkbox"/> TestCase1	BMC_Web_Login_Test
<input type="checkbox"/> TestCase2	BMC_Web_Power_Control
<input type="checkbox"/> TestCase3	BMC_Web_FWupdate
<b>IPMI</b>	
<input checked="" type="checkbox"/> TestCase3	IPMI_Get_Device_ID
<input type="checkbox"/> TestCase4	IPMI_Power_Control_Test
<b>Redfish</b>	
<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

**Buttons:** 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 'FAIL' status for a specific test. It also shows a 'PASS' status for a Redfish test (A113-2).

**Test Case Selection Table (Center):**

Test Case ID	Test Case
<b>WEBUI</b>	
<input checked="" type="checkbox"/> TestCase1	BMC_Web_Login_Test
<input type="checkbox"/> TestCase2	BMC_Web_Power_Control
<input type="checkbox"/> TestCase3	BMC_Web_FWUpdate
<b>IPMI</b>	
<input checked="" type="checkbox"/> TestCase3	IPMI_Get_Device_ID
<input type="checkbox"/> TestCase4	IPMI_Power_Control_Test
<b>Redfish</b>	
<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_Document
<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_Collections
<input type="checkbox"/> A113-9	A113-9_[POST]Computer_System_Collections
<input type="checkbox"/> A008-11	A008-11_[GET]Computer_System_Collections
<input type="checkbox"/> A008-12	A008-12_[PATCH]Computer_System_Collections
<input type="checkbox"/> A008-13	A008-13_[PATCH]System_OEM_Profile
<input type="checkbox"/> A008-14	A008-14_[POST]Computer_System_Collections

**Configuration Panel (Right):**

- BMC IP:** 192.168.0.121
- User ID:** 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

00:00:00.114

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/>