

About the OpenHPC-Get-Mac Application:

The OpenHPC-Get-Mac Application is available here at [GitHub](#).

It contains two directories: Codes and Doc-Files.

The Codes directory contains:

- ipmi.py
- displayInfoIPMI.py
- redfish.py
- displayInfoRedfish.py
- userInterfaceApp.py

ipmi.py is for gathering information from BMC using IPMI. It uses multithreading to improve the speed of gathering information for a large cluster.

displayInfoIPMI.py is for displaying the collected data by IPMI in a nice friendly format.

redfish.py is for gathering information from BMC using DMTF Redfish. It uses multithreading to improve the speed of gathering information for a large cluster.

displayInfoRedfish.py is for displaying the collected data by Redfish in a nice friendly format.

userInterfaceApp.py is for running the interface of the application.

The Doc-Files directory contains the following input files:

- Readme
- credentialInfo.txt
- clusterInfo

And also, the following two output files will be added to the Doc-Files directory after running the application

- ClusterNetInfo.json
- input.local

Readme file has information about the application.

credentialInfo.txt has the BMC_User and BMC_Password of the cluster.

clusterInfo is the default file that contains a list of BMC IP addresses of the nodes we want to add to the cluster. We can use this default file or any other file with those IP addresses by giving its path when the application asks for it.

ClusterNetInfo.json is the output file to save the collected data in a JSON format.

“input.local” file is the output file that contains the value of compute_prefix and sms_eth_internal variables, the name, BMC-IP address, and mac address of the nodes based on the selected internal NIC.

- compute_prefix
- sms_eth_internal
- c_name[i]
- c_bmc[i]
- c_mac[i]

How To use the application:

Step 1: Make sure you have the following python libraries.

- requests
- ipaddress
- json
- datetime
- subprocess
- codecs
- Thread
- time
- os

You can use one of the following commands to install a package if you do not have it.

- `python -m pip install package-name`
- `pip install --user package-name`
- `python3 -m pip install package-name`
- `pip3 install --user package-name`

Step 2: Set up input files.

- Modify clusterInfo file in the Doc-Files directory, and insert the BMC IP addresses of the nodes there(one IP per line).
- Modify the credentialInfo.txt file in the Doc-Files directory, and set up the BMC-User and BMC_Password of the cluster in this file.

Step 3: Run the OpenHPC-Get-Mac application.

Run the OpenHPC-Get-Mac application using the following command.

```
python3 userInterfaceApp.py
```

Step 4: Follow the process based on the interface guideline.

The application gives you four options:

- 1) About the Application
- 2) Network Discovery

- 3) Update Cluster Mac Address Information
- 4) Exit

The first option shows some information about the application.

The second one is network discovery, and you have two options, and we can select which hardware management technology we want to use to collect data:

- 1) IPMI
- 2) Redfish

```

                                Gathering Mac Address of Internal Network
                                by Redfish/IPMI Hardware Management Tool
                                .....
                                .....
                                .....
                                .....
                                .....
                                .....
                                .....
                                .....

.....
Please select a number from the menu:
 1) About the Application
 2) Network Discovery
 3) Update Cluster Mac Address Information
 4) Exit

Answer:2

.....
Select Hardware Management Technology(Default=Redfish):
 1) IPMI
 2) Redfish

Answer:

```

Then it asks you to select the path to the cluster information file (Default: ../Doc-Files/clusterInfo).

For IPMI choice:

you also need to choose the vendor of the new compute-nodes(Default=Dell):

- 1) Dell
- 2) SuperMicro
- 3) Intel

4) Others

This step is because of having different IPMI commands to gather mac addresses for various vendors. We do not have this step when we use Redfish to collect data.

It then shows the collected data in a friendly format and saves them in the ../Doc-Files/ClusterNetInfo.json file. Then it comes back to the menu.

```
-----
BMC_IP: 10.101.6.1
BMC Hostname: cpu-6-1
Hostname: None
Timestamp: 2021-01-27 04:20
Power On: True
NIC Mac Addresses information:
NIC_Id : NIC.Embedded.1-1-1
MACAddress : 7C:D3:0A:C6:39:60
NIC_Id : NIC.Embedded.2-1-1
MACAddress : 7C:D3:0A:C6:39:62
-----
```

```
-----
BMC_IP: 10.101.3.10
BMC Hostname: cpu-3-10
Hostname: None
Timestamp: 2021-01-27 04:20
Power On: True
NIC Mac Addresses information:
NIC_Id : NIC.Embedded.1-1-1
MACAddress : 7C:D3:0A:D7:D1:08
NIC_Id : NIC.Embedded.2-1-1
MACAddress : 7C:D3:0A:D7:D1:0A
-----
```

```
-----
BMC_IP: 10.101.4.3
BMC Hostname: cpu-4-3
-----
```

```
-----
BMC_IP: 10.101.92.8
Hostname: None
Timestamp: 2021-01-27 02:59
NIC Mac Addresses information:
MACAddress : 78:2b:cb:2f:be:20
MACAddress : 78:2b:cb:2f:be:21
-----
```

```
-----
BMC_IP: 10.101.92.6
Hostname: None
Timestamp: 2021-01-27 02:59
NIC Mac Addresses information:
MACAddress : 84:2b:2b:48:31:8b
MACAddress : 84:2b:2b:48:31:8c
-----
```

```
-----
BMC_IP: 10.101.92.2
Hostname: None
Timestamp: 2021-01-27 02:59
NIC Mac Addresses information:
MACAddress : 84:2b:2b:55:12:6b
MACAddress : 84:2b:2b:55:12:6c
-----
```

The third option is to Update Cluster Mac Address Information.

```

Please select a number from the menu:
 1) About the Application
 2) Network Discovery
 3) Update Cluster Mac Address Information
 4) Exit
Answer:3
.....
Select Hardware Management Technology(Default=Redfish):
 1) IPMI
 2) Redfish
Answer:1
.....
Select Network Interface?(Default=NIC1):
 1)NIC1
 2)NIC2
 3)NIC3
 4)NIC4
Answer:1
.....
Select compute_prefix(Default=c):
Answer:zc-92-
.....
Select the path to the cluster information file (Default: ../Doc-Files/clusterInfo):

```

It asks to select the hardware management technology we want to use, the number of the internal NIC, and the compute prefix we want to use. Then it asks to choose the path to the cluster information file (Default: ../Doc-Files/clusterInfo), and for IPMI, it Also asks to select the compute-nodes vendor.

Output

After collecting data, the gathered discovery Information will be saved in the ../Doc-Files/ClusterNetInfo.json file. The “input.local” file will then be created and held in the ../Doc-Files/input.local file.

```
NIC_Id : NIC.Embedded.2-1-1
MACAddress : 7C:D3:0A:D7:C3:54
```

```
-----

BMC_IP: 10.101.3.6
BMC Hostname: cpu-3-6
Hostname: compute-26
Timestamp: 2021-01-27 04:23
Power On: True
NIC Mac Addresses information:
NIC_Id : NIC.Embedded.1-1-1
MACAddress : 7C:D3:0A:D0:D8:22
NIC_Id : NIC.Embedded.2-1-1
MACAddress : 7C:D3:0A:D0:D8:24
```

```
-----

BMC_IP: 10.101.6.6
BMC Hostname: compute-6-6
Hostname: compute-56
Timestamp: 2021-01-27 04:23
Power On: True
NIC Mac Addresses information:
NIC_Id : NIC.Embedded.1-1-1
MACAddress : 7C:D3:0A:C6:3F:12
NIC_Id : NIC.Embedded.2-1-1
MACAddress : 7C:D3:0A:C6:3F:14
```

```
BMC_IP: 10.101.92.8
Hostname: c18
Timestamp: 2021-01-27 05:27
NIC Mac Addresses information:
MACAddress : 78:2b:cb:2f:be:20
MACAddress : 78:2b:cb:2f:be:21
```

```
-----

BMC_IP: 10.101.92.10
Hostname: c20
Timestamp: 2021-01-27 05:27
NIC Mac Addresses information:
MACAddress : 84:2b:2b:48:28:c2
MACAddress : 84:2b:2b:48:28:c3
```

```
-----

BMC_IP: 10.101.92.7
Hostname: c17
Timestamp: 2021-01-27 05:27
NIC Mac Addresses information:
MACAddress : 84:2b:2b:48:31:eb
MACAddress : 84:2b:2b:48:31:ec
```

ClusterNetInfo.json

```

41 },
42 "systemName": "System.Embedded.1",
43 "HN-BMC": "cpu-2-5",
44 "power state": true
45 }
46
47
48 {
49   "BMC_IP": "10.101.3.2",
50   "hostname": "compute-22",
51   "time": "2021-01-27 04:23",
52   "NICs": {
53     "NIC1": {
54       "NIC_Id": "NIC.Embedded.1-1-1",
55       "URI": "/redfish/v1/Systems/System.Embedded.1/EthernetInterfaces/NIC.Embedded.1-1-1",
56       "MACAddress": "7C:D3:0A:D0:E2:90"
57     },
58     "NIC2": {
59       "NIC_Id": "NIC.Embedded.2-1-1",
60       "URI": "/redfish/v1/Systems/System.Embedded.1/EthernetInterfaces/NIC.Embedded.2-1-1",
61       "MACAddress": "7C:D3:0A:D0:E2:92"
62     }
63   },
64   "systemName": "System.Embedded.1",
65   "HN-BMC": "cpu-3-2",
66   "power state": true
67 }
68
69

```

input.local

```

input.local
1 compute_prefix="${compute_prefix:-compute-}"
2 sms_eth_internal="${sms_eth_internal:-eth1}"
3 c_name[0]=compute-1
4 c_name[1]=compute-15
5 c_name[2]=compute-22
6 c_name[3]=compute-14
7 c_name[4]=compute-45
8 c_name[5]=compute-39
9 c_name[6]=compute-31
10 c_name[7]=compute-37
11 c_name[8]=compute-5
12 c_name[9]=compute-3
13 c_name[10]=compute-19
14 c_name[11]=compute-36
15 c_name[12]=compute-57
16 c_name[13]=compute-43
17 c_name[14]=compute-9
18 c_name[15]=compute-24
19 c_name[16]=compute-16
20 c_name[17]=compute-4
21 c_name[18]=compute-35
22 c_name[19]=compute-11
23 c_name[20]=compute-50
24 c_name[21]=compute-28

```