

Replay 自动化回放教程

该教程仅表示**回放本身的自动化**，替代原来 ControlDesk 中手动操作；该 replay 自动化程序会自动给 ECU 上电（KL30&KL15），**但是回放结束后不会给 ECU 下电**，回放结束后，如果需要下电，请手动（网页中登录 192.168.140.50）执行下电（当前断掉 KL15 即可）

注意事项：

1. 脚本工作路径: `cd /home/dspace/workspace/dspace_replay_plugin_demo/`
2. 脚本执行、监控等操作均在 HPP1（192.168.140.101）上执行

操作步骤：

- Step1→预备工作：
 - ❖ 登录 win10 机器→打开 MobaXterm→ssh 到 HPP1（用户名，密码均为 dspace）
 - ❖ 当用户第一次登录上 HOL 台架且不确定台架状态时，请直接在 HPP1 中执行 reset 脚本（请在同一个终端中执行，切勿另起终端）
 - `$cd /home/dspace/workspace/dspace_replay_plugin_demo/`
 - `$python3.9 system_reset/system_reset.py esi`

```
dspace@dspace-Sensor-Simulation-HPP1:~/workspace/dspace_replay_plugin_demo$ python3.9 system_reset/system_reset.py esi
2023-11-26 14:47:22.980 - [INFO] - Start poweroff and poweron esi and ecu.
2023-11-26 14:47:22.980 - [INFO] - System Reset Start ...
2023-11-26 14:47:22.980 - [INFO] - Start Kill rtmaps runtime ...
2023-11-26 14:47:23.001 - [INFO] - No rtmaps runtime process can be closed.
2023-11-26 14:47:23.016 - [INFO] - Connected (version 2.0, client OpenSSH.8.2p1)
2023-11-26 14:47:23.090 - [INFO] - Authentication (password) successful!
2023-11-26 14:47:23.299 - [INFO] - No process can be closed.
2023-11-26 14:47:23.313 - [INFO] - Connected (version 2.0, client OpenSSH.8.2p1)
2023-11-26 14:47:23.394 - [INFO] - Authentication (password) successful!
2023-11-26 14:47:23.651 - [INFO] - Restart pyro server service on pc2 success.
2023-11-26 14:47:26.654 - [INFO] - Restart replay API service on pc1 success.
2023-11-26 14:47:26.654 - [INFO] - Start poweroff ECU, ESI ...
2023-11-26 14:47:26.739 - [INFO] - ## The current outputs' status:
2023-11-26 14:47:26.739 - [INFO] - # [{"ID": 1, "Name": "RTPC1 + LBX", "State": 1, "Action": 6, "Delay": 5000, "Current": 563, "PowerFactor": 0.72, "Phase": 313.38, "Energy": 448264, "ReverseEnergy": 0, "EnergyNR": 448264, "ReverseEnergyNR": 0, "Load": 92}, {"ID": 2, "Name": "LoggingPC", "State": 1, "Action": 6, "Delay": 5000, "Current": 465, "PowerFactor": 0.92, "Phase": 340.44, "Energy": 463958, "ReverseEnergy": 0, "EnergyNR": 463958, "ReverseEnergyNR": 0, "Load": 90}, {"ID": 3, "Name": "ECU_KL30", "State": 1, "Action": 6, "Delay": 5000}, {"ID": 4, "Name": "ECU_KL15", "State": 1, "Action": 6, "Delay": 5000}]
2023-11-26 14:47:26.832 - [INFO] - ## The current outputs' status:
2023-11-26 14:47:26.832 - [INFO] - # [{"ID": 1, "Name": "DRPC1 + RTPC2", "State": 1, "Action": 6, "Delay": 5000, "Current": 830, "PowerFactor": 0.91, "Phase": 336.41, "Energy": 448249, "ReverseEnergy": 0, "EnergyNR": 448249, "ReverseEnergyNR": 0, "Load": 174}, {"ID": 2, "Name": "DRPC2", "State": 1, "Action": 6, "Delay": 5000, "Current": 611, "PowerFactor": 0.96, "Phase": 470.742, "Energy": 470742, "ReverseEnergy": 0, "EnergyNR": 470742, "ReverseEnergyNR": 0, "Load": 135}, {"ID": 3, "Name": "Free Contact 3", "State": 0, "Action": 6, "Delay": 5000}, {"ID": 4, "Name": "ESI_Unit", "State": 1, "Action": 6, "Delay": 5000}]
2023-11-26 14:47:27.044 - [INFO] - waiting for 5s ...
```

如下图直到出现 system reset successfully，表明 replay 系统已经 ready，且此时 replay 系统会将 ECU 上电（KL30 & KL15 power on）。

```
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_3 was successfully de-initialized. [99.013119134]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_2 was successfully de-initialized. [98.997116226]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_1 was successfully de-initialized. [100.002114075]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth2_1 was successfully de-initialized. [100.204113353]
2023-11-26 14:49:31.237 - [INFO] - System information. Hardware D56051, SN: 1232245, Firmware: 23.1.3, FPGA: 3.0.4, CPLD: 1.2, [0.0101535815]
2023-11-26 14:49:31.237 - [INFO] - System information. Hardware D56341, SN: 1174889, Firmware: 23.1.3, FPGA: 3.0.4, CPLD: 1.0, Temperature FPGA: 36 DEG C, PCB: 35 DEG C, [0.010180926]
2023-11-26 14:49:31.237 - [INFO] - System information. Hardware D56342, SN: 1175228, Firmware: 23.1.3, FPGA: 3.0.4, CPLD: 1.0, Temperature FPGA: 39 DEG C, PCB: 38 DEG C, [0.010207769]
2023-11-26 14:49:31.237 - [INFO] - System information. Hardware D56201, SN: 1237285, Firmware: 23.1.3, FPGA: 1.17, CPLD: 1.1, Temperature FPGA: 36 DEG C, PCB: 35 DEG C, [0.0102339605]
2023-11-26 14:49:31.237 - [INFO] - Application unloaded. [0.015708114]
2023-11-26 14:49:31.237 - [INFO] - System information. SCALEXIO Real-Time PC (HCP P03), SN: 8907246, Firmware: 23.1.3, FPGA: 8.5.1, CPLD: 4.1, Temperature CPU: 54 DEG C, [0.010322553]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_1 was successfully de-initialized. [0.380274987]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_4 was successfully de-initialized. [0.5356083425]
2023-11-26 14:49:31.237 - [INFO] - The Ethernet interface Eth1_2 was successfully de-initialized. [0.618608097]
2023-11-26 14:49:31.237 - [INFO] - System information. SCALEXIO Real-Time PC (HCP P03), SN: 8907592, Firmware: 23.1.3, FPGA: 8.5.1, CPLD: 4.1, Temperature CPU: 62 DEG C, [1.2334143025]
2023-11-26 14:49:31.237 - [INFO] - Application unloaded. [1.2343051145]
2023-11-26 14:49:31.237 - [INFO] - Unloading initialization finished with code 0
2023-11-26 14:49:31.237 - [INFO] - System Reset Successfully.
dspace@dspace-Sensor-Simulation-HPP1:~/workspace/dspace_replay_plugin_demo$
```

- Step2→开始回放：[需要在 Step1 完成之后执行]

在 HPP1 脚本工作路径中执行 `python3.9 start_replay.py`

（请在同一个终端中执行，切勿另起终端）

○ `$python3.9 start_replay.py`

- Step3→查看回放进程

- `$tail -f /var/log/dspace/replay_api_server.log`

参照下图表示回放正常在回放:

下图表示该轮回放正常结束:

- 遇到任何故障，先执行 **Step4 回放终止操作步骤**

- 若依然无法恢复，在 HPP1 脚本工作路径执行：
- `$python3.9 system_reset/system_reset.py sclx`

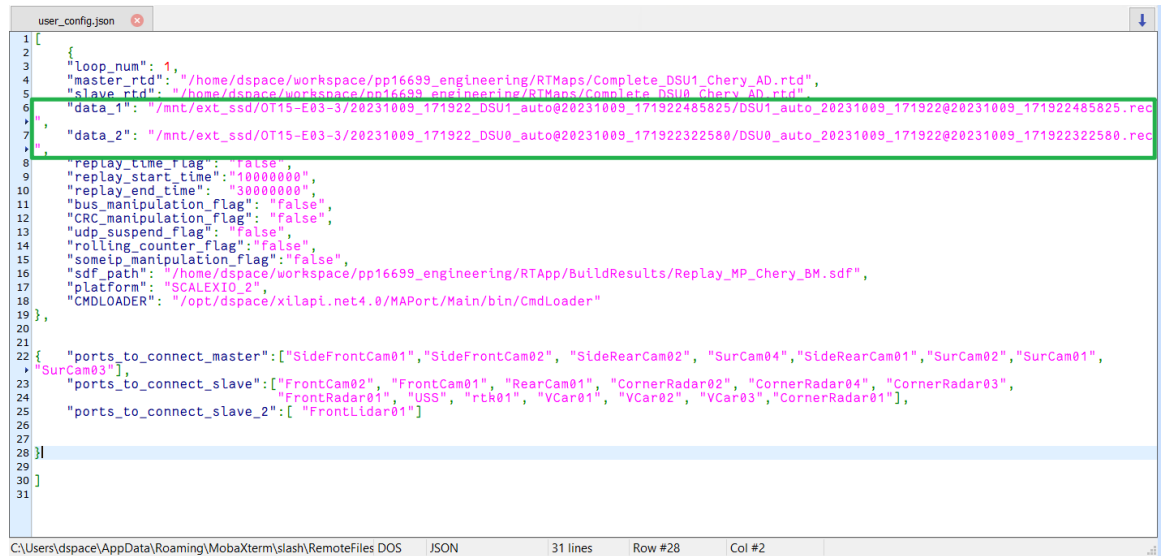
Q&A:

1. 如何更换数据？

在 HPP1 中脚本工作路径下编辑 user_config.json 文件，具体如下 Json 文件中：（注意引号）

data_1→HPP1 中的数据路径中选择.rec 文件[DSU1]

data_2→HPP2 中的数据路径中选择.rec 文件[DSU0];



```

1 [
2   {
3     "loop_num": 1,
4     "master_rtd": "/home/dspace/workspace/pp16699_engineering/RTMaps/Complete_DSU1_Chery_AD_rtd",
5     "slave_rtd": "/home/dspace/workspace/pp16699_engineering/RTMaps/Complete_DSU0_Chery_AD_rtd",
6     "data_1": "/mnt/ext_ssd/OT15-E03-3/20231009_171922_DSU1_auto@20231009_171922485825/DSU1_auto_20231009_171922485825.rec",
7     "data_2": "/mnt/ext_ssd/OT15-E03-3/20231009_171922_DSU0_auto@20231009_171922322580/DSU0_auto_20231009_171922322580.rec",
8     "replay_time_flag": "false",
9     "replay_start_time": "10000000",
10    "replay_end_time": "30000000",
11    "bus_manipulation_flag": "false",
12    "CRC_manipulation_flag": "false",
13    "udp_suspend_flag": "false",
14    "rolling_counter_flag": "false",
15    "someip_manipulation_flag": "false",
16    "sdf_path": "/home/dspace/workspace/pp16699_engineering/RTApp/BuildResults/Replay_MP_Chery_BM.sdf",
17    "platform": "SCALEXIO_2",
18    "CMDLOADER": "/opt/dspace/xilapi.net4.0/MAPort/Main/bin/CmdLoader"
19  },
20  {
21    "ports_to_connect_master": ["SideFrontCam01", "SideFrontCam02", "SideRearCam02", "SurCam04", "SideRearCam01", "SurCam02", "SurCam01", "SurCam03"],
22    "ports_to_connect_slave": ["FrontCam02", "FrontCam01", "RearCam01", "CornerRadar02", "CornerRadar04", "CornerRadar03", "FrontRadar01", "USS", "rtk01", "VCar01", "VCar02", "VCar03", "CornerRadar01"],
23    "ports_to_connect_slave_2": ["FrontLidar01"]
24  }
25 ]
26 ]
27 ]
28 ]
29 ]
30 ]
31 ]

```

2. 本次回放结束后，用户仍然想继续回放，如何操作？（请在同一个终端中执行，切勿另起终端）

Case1: 用户仍然想继续回放，且用户不需要 ECU 下电：

- ❖ 如果上一次回放 Job 是完整回放结束，请在脚本工作路径直接执行：
 - `$python3.9 start_replay.py`
- ❖ 如果上一次回放 Job 是回放途中人为终止，请在脚本工作路径直接执行：
 - `$python3.9 system_reset/system_reset.py kill`

待 system reset 成功之后，执行以下命令

- `$python3.9 start_replay.py`

Case2: 用户仍然想继续回放，且用户需要 ECU 下电，请在脚本工作路径下直接执行：

- `$python3.9 system_reset/system_reset.py ecu`
- 待 reset 成功之后，执行以下命令
- `$python3.9 start_replay.py`

3. user_config.json 文件解释，见下图

```

GNU nano 4.8 user_config.json
{
  "loop_num": 1,
  "data_1": "/mnt/ext_ssd/auto/1016 SOMEIP/20231016 120110 DSU0 auto@20231016 120110685053/rec",
  "data_2": "/mnt/ext_ssd/auto/1016 SOMEIP/20231016 120110 DSU0 auto@20231016 120110355900/DSU0 auto 20231016 120110355900.rec",
  "replay_time_flag": "false",
  "replay_start_time": "100000000",
  "replay_end_time": "300000000",
  "bus_manipulation_flag": "false",
  "CRC_manipulation_flag": "false",
  "udp_suspend_flag": "false",
  "sdf_path": "/home/dspace/workspace/pp16699_engineering/RTApp/BuildResults/Replay_MP_Chery_BM.sdf",
  "platform": "SCALEXIO_2",
  "CHDLADER": "/opt/dspace/xilapi.net4.0/MAPort/Main/bin/CmdLoader",
},

{
  "ports_to_connect_master": ["SideFrontCam01", "SideFrontCam02", "SideRearCam02", "SurCam04", "SideRearCam01", "SurCam02", "SurCam01", "SurCam03"],
  "ports_to_connect_slave": ["FrontCam02", "FrontCam01", "RearCam01", "CornerRadar02", "CornerRadar04", "CornerRadar03", "FrontRadar01", "USS", "rtk01", "VCar01", "VCar02", "VCar03", "CornerRadar01"],
  "ports_to_connect_slave_2": ["FrontLidar01"]
}
}

```

- a. "loop_num": 1, (当前数据回放次数, 即回放几轮, 1 表示只回放一次)
- b. "data_1": (PC1 数据路径对应的是 DSU1 数据路径)
- c. "data_2": (PC2 数据路径对应的是 DSU0 数据路径)
4. system_reset 功能介绍:

共有以下几个参数:

 - a. kill (#python3.9 systemctl_reset/system_reset.py kill)
 - i. 该参数作用: 杀死 HPP1 & HPP2 rtmaps runtime 进程, 重启 HPP1 replay service & HPP2 pyro service 两个服务进程
 - b. ecu (#python3.9 systemctl_reset/system_reset.py ecu)
 - i. 该参数作用: kill 功能+ECU KL15 下电→ECU KL 15 上电;
 - c. esi (#python3.9 systemctl_reset/system_reset.py esi)
 - i. 该参数作用: ecu 功能+ESI 重启
 - d. sclx (#python3.9 systemctl_reset/system_reset.py sclx)
 - i. 该参数作用: ESI 功能+SCLX 重启, 属于终极重置大法。

注: 按照顺序每个参数均是在上一个参数功能上叠加一些功能, 即 reset 的功能也是层层递进。其中不同参数执行后需要花费的时长统计约为:

不同 Reset 参数	完成期望目标花费时间
\$python3.9 systemctl_reset/system_reset.py kill	~4s
\$python3.9 systemctl_reset/system_reset.py ecu	~25s
\$python3.9 systemctl_reset/system_reset.py esi	~125s
\$python3.9 systemctl_reset/system_reset.py sclx	~160s