花蓮縣智慧校園智慧圖書管理系統及智慧保健管理系統建置案

Deployment Document

00_DB/ VM Credential

Mariadb

- Credential
  - Account: root
  - Password: Mitac@123

MS SQL

- Credential
  - Account: mitacmssql
  - Password: mitac@12345

PostgresSQL

- Credential
  - Account: postgres
  - Password: Mitac@123

VM for Nifi

- Credential
  - Account: root
  - Password: Mitac@123

Window Jump Machine

- Credential
  - Account: administrator
  - Password: Mitac@123

01_Software Installation and Setting

Install The Following Softwares on Local Machine

PuTTy

- Version: 0.76
  - https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

FileZilla Client

- Version: 3.54.1
  - https://filezilla-project.org/download.php?type=client

SQL Server Management Studio

- Version: 18.9.2
  - https://go.microsoft.com/fwlink/?linkid=2168063&clcid=0x409

MariaDB

- Version: 10.6.3
  - https://downloads.mariadb.org/interstitial/mariadb-10.6.3/winx64-packages/mariadb-10.6.3-winx64.zip/from/https%3A//ftp.ubuntu-tw.org/mirror/mariadb/

PgAdmin

- Version: 5.4
  - https://www.pgadmin.org/download/pgadmin-4-windows/

Install the Following Softwares on VM

Nifi

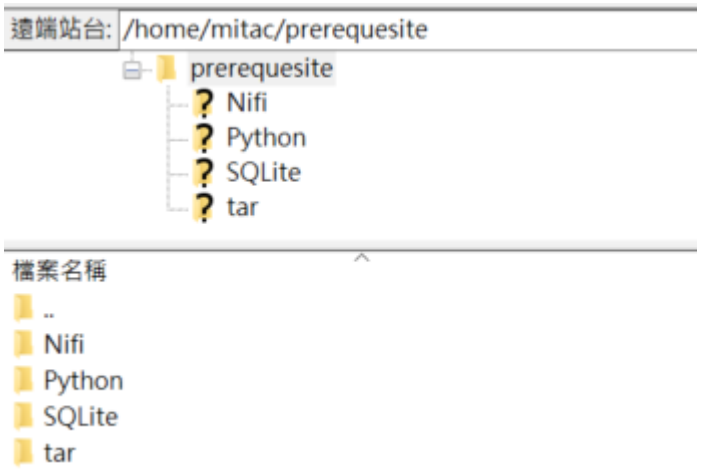
- host: 192.168.14.167
- Version: 1.10.0
  - https://archive.apache.org/dist/nifi/1.10.0/

- Nifi Setting
  - web properties
    - path: /home/----/nifi-1.10.0/conf/
    - file: nifi.properties
    - change:
      nifi.web.http.port = 8080 to nifi.web.http.port = 8081
  - JVM memory settings
    - path: /home/----/nifi-1.10.0/conf/
    - file: nifi.properties
    - change:
    - java.arg.3=-Xmx512m to java.arg.3=-Xmx8192m
  - JDBC
    - path: /home/----/nifi-1.10.0/lib/
    - Mariadb:
      mariadb-java-client-2.7.2.jar
    - MSSQL:
      mssql-jdbc-9.2.0.jre8.jar
    - PostgreSQL:
      postgresql-42.2.22.jar
    - The above JDBCs is provided in the production_env folder:
- Run Nifi
  - cd /root/nifi-1.10.0/bin
  - ./nifi.sh start
  - ./nifi.sh status
  - ./nifi.sh stop

Production Environment Deployment (CentOS7)

(grade color ones is the terminal command)

- Copy and paste the prerequisite



- Folder:

  04_mainFolder/prerequisite/tar

- Target path:

  /home/----/

- Dependency Packages
  - sudo yum install wget
  - sudo yum groupinstall "Development tools" -y
  - sudo yum -y install openssl-devel bzip2-devel libffi-devel xz-devel
  - sudo yum update -y

- SQLite
  - provided in production_env folder
  - path:/home/----/prerequisite/SQLite
  - Rename the old version SQLite (/usr/bin/sqlite3)
    sudo mv -v /usr/bin/sqlite3 /usr/bin/sqlite3.7
  - cd sqlitewhrer-autoconf-3360000

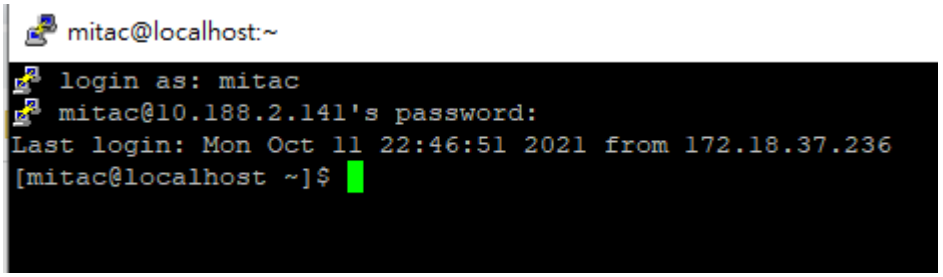
- ./configure --prefix=/usr/local
- make
- sudo make install

- Python
  - provided in production_env folder
  - path:/home/----/prerequisite/Python
  - cd Python-3.8.12
  - ./configure --enable-optimizations
  - sudo make altinstall
  - Upgrade pip3.8
    /usr/local/bin/python3.8 -m pip install --upgrade pip
  - Install pymysql
    pip3.8 install pymysql
    pip3.8 install --upgrade pymysql

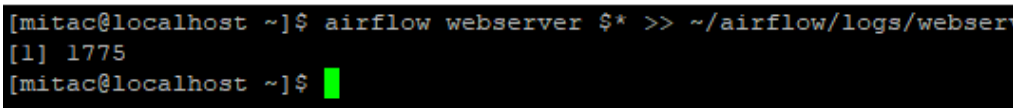
- Airflow
  - Assign AIRFLOW_PATH and VERSION
    - export AIRFLOW_HOME=~/airflow
    - AIRFLOW_VERSION=2.1.4
    - PYTHON_VERSION="$(python3.8 --version | cut -d " " -f 2 | cut -d "." -f 1-2)"
  - Install
    pip3.8 install
    "apache-airflow==${AIRFLOW_VERSION}"
  - Set up environment variable
    1. export LD_LIBRARY_PATH=/usr/local/lib:$LD_LIBRARY_PATH
    2. vi .bash_profile #It's a hidden file, located in your home/user folder and add the following code:
       ```
       LD_LIBRARY_PATH=/usr/local/lib:$LD_LIBRARY_PATH
       export LD_LIBRARY_PATH
       ```
  - Initialize
    will create a airflow folder on AIRFLOW_HOME path

```
airflow db init
```

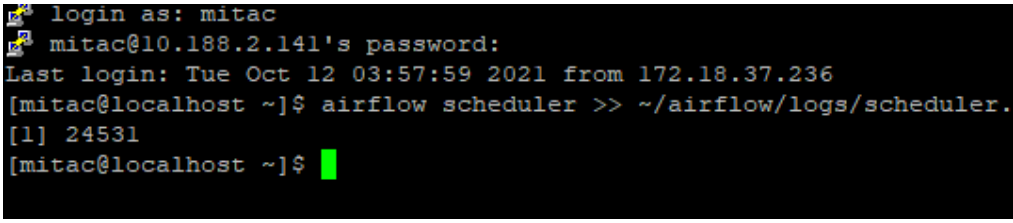
- Change Airflow Configure (airflow.cfg):
  ```
  default_timezone = 'utc+8'
  load_examples = False
  endpoint_url = http://localhost:8082
  ```
- Create User
  - airflow users create --user admin -f admin --lastname admin --role Admin -e admin
- Enter Password
- Run
  - Start Airflow Webserver and Airflow Scheduler
  - Using PuTTY to log in



  - airflow webserver $* >> ~/airflow/logs/webserver.logs &



  - airflow scheduler >> ~/airflow/logs/scheduler.logs &



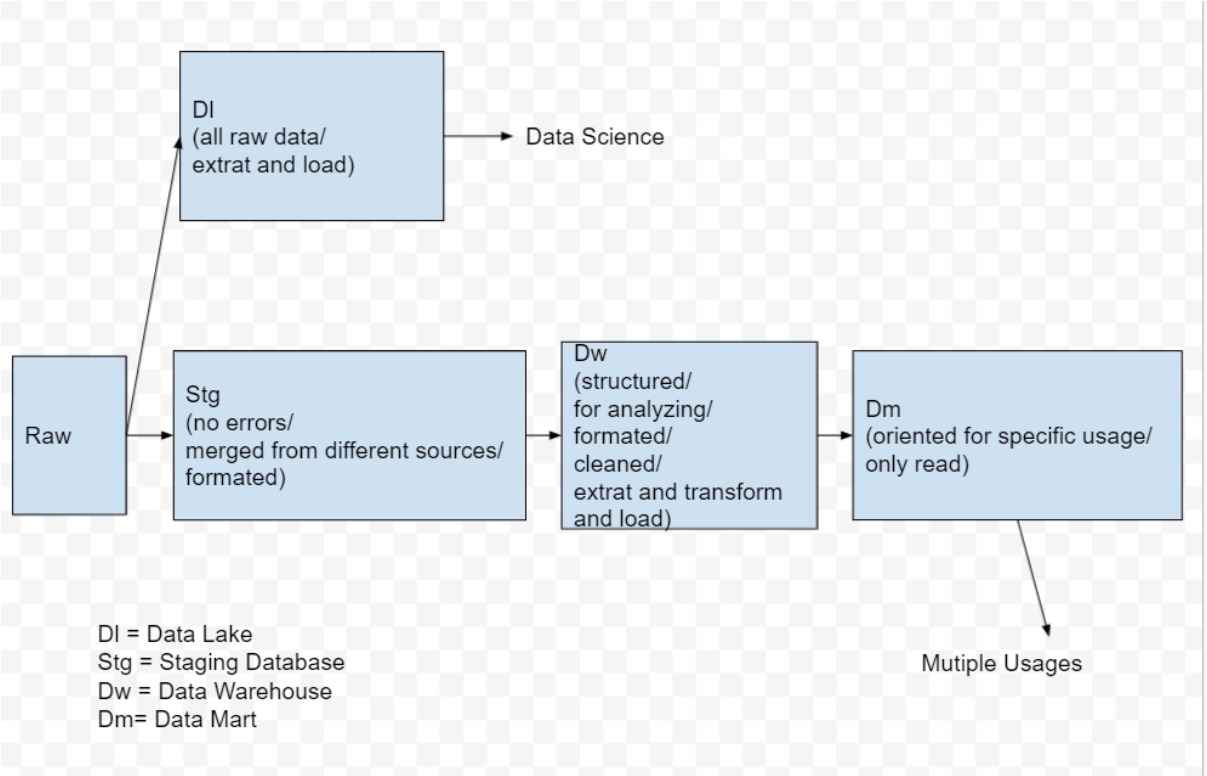
  - pip3.8 install apache-airflow-providers-slack[http]

- OpenJDK8
  - Install OpenJDK 8 JDK
    sudo yum install java-1.8.0-openjdk-devel

- export JAVA_HOME=/usr/lib/jvm/adoptopenjdk-8-hotspot-amd64/

02_DB Deployment

Database Design Framework



Staging DB-MariaDB

Schema

1. run the following scripts on MariaDB Client:
   Path: ***.\production_env\01_createdDB***

   a. 01_MDB_DH:
      device history stage
   b. 02_MDB_HEAL:
      health relative stage
   c. 03_MDB_LIB:
      library relative stage

Data Warehouse-MS SQL Server Mgmt Studio

Schema

1. run the script on MS SQL Server Mgmt Studio:
   Path: ***.\Hua\production_env\01_createdDB***

   a. 04_SQL_DH_DW:
      device history data warehouse
   b. 05_SQL_DW:
      health+library data warehouse

Satic Data

2. run the script on MS SQL Server Mgmt Studio:
   Path: ***.\production_env\02_staticDB***

   a. 01_SQL_DHDW_Data:
      static data for device history data warehouse
   b. 02_SQL_DW_Data:
      static data for health+library data warehouse

Data Mart-MS SQL Server Mgmt Studio

Schema

1. run the script on MS SQL Server Mgmt Studio:
   Path: ***.\Hua\production_env\01_createdDB***

   a. 06_SQL_DM:
      health+library data mart

Satic Data

2. run the script on MS SQL Server Mgmt Studio:
   Path: ***.\production_env\02_staticDB***

   a. 03_SQL_DM_Data:
      static data for health+library data warehouse

SQL Server Agent-MS SQL Server Mgmt Studio

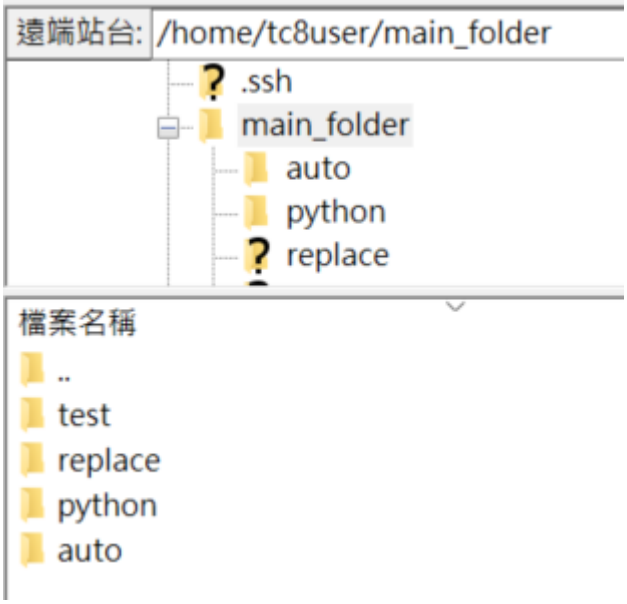
Jobs

1. run the script on MS SQL Server Mgmt Studio:
   Path: ***.\Hua\production_env\03_jobs***

    a. 00_monthly_book_borrowed&total_borrower_b4
    b. 01_jb_monthly_book_borrowed
    c. 02_jb_monthly_total_borrower
    d. 03_jb_monthly_book_per_person_rank
    e. 04_jb_book_cover
    f. 05_jb_rpt_book_recommendation
    g. 06_jb_weekly_book_borrowed
    h. 07_jb_weekly_total_borrower
    i. 08_jb_weekly_book_per_person_rank

03_Python File & CSV Location

Copy and paste the main_folder



Folder:

04_mainFolder/main_folder

Target path:

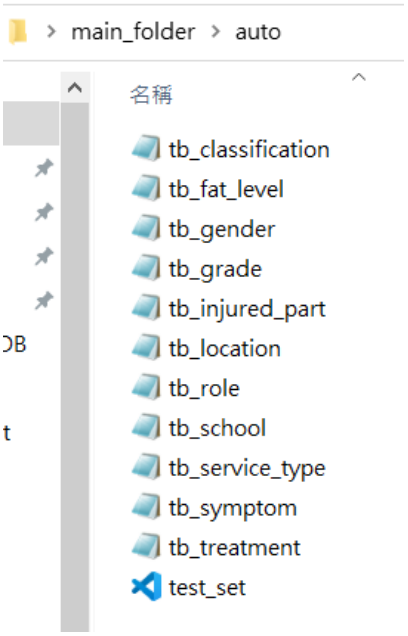
/home/----/

List of required csv and python files:

The ways to modify the highlighted python files will be shown in 05_Modified Python Files.

Auto:

Path: /home/----/main_folder/auto

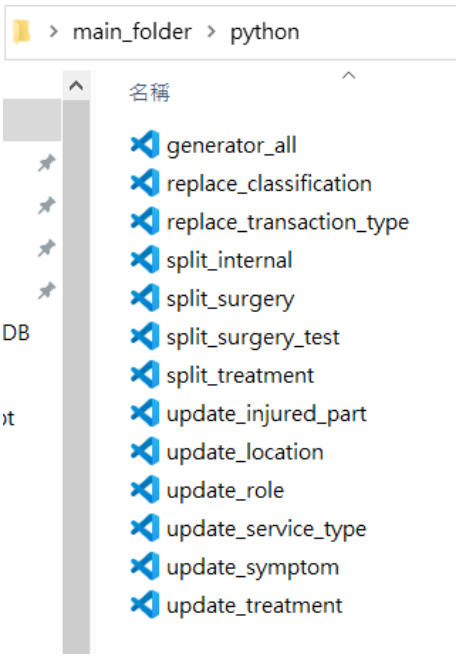


- csv -- split by ‘comma’ (,)
  - tb_classification:
    classification of books
  - tb_fat_level:
    student fat level
  - tb_gender:
    gender
  - tb_grade:
    student grade/ teacher/ volunteer
  - tb_injured_part
    injured part
  - tb_location:
    places of school
  - tb_role:
    role in system
  - tb_school:
    school name
  - tb_service_type:
    internal, external and other
  - tb_symptom:
    internal and external symptoms
  - tb_treatment
    treatments and actions
- python

- test_set:
  generate test data for Nifi data pipeline test

Python:

Path: /home/----/main_folder/python

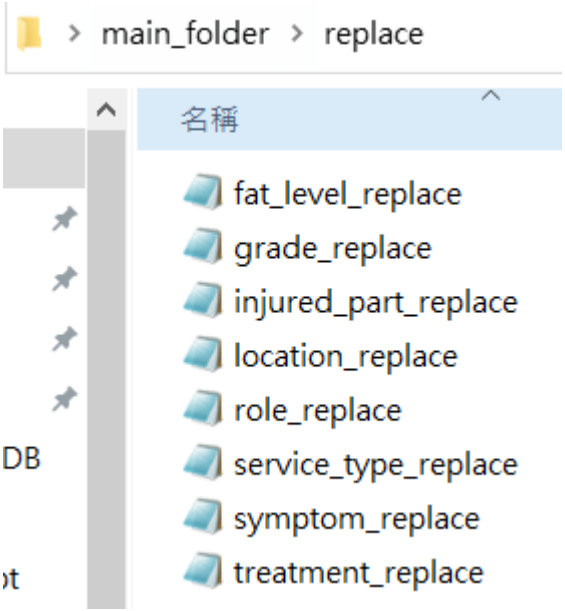


- python
  - generator_all:
    process devices history data from PostgreSQL
  - replace_classification:
    replace classification with its uid
  - replace_transaction_type:
    replace transaction type with its uid
  - split_internal:
    split internal care record by symptom
  - split_surgery:
    split surgical care record by symptom
  - split_treatment:
    split treatment record by treatment
  - update_injured_part:
    record the new inured part coming from source
  - update_location:
    record the new location coming from source

- update_role:
  record the new role coming from source
- update_service_type:
  record the new service type coming from source
- update_symptom:
  record the new symptom coming from source
- update_treatment:
  record the new treatment coming from source

Replace:

Path: /home/----/main_folder/replace



- csv -- split by ‘tab’ (\t)
  - fat_level_replace:
    store the fat level uid
  - injured_part_replace:
    store the injured part uid
  - location_replace:
    store the location uid
  - role_replace:
    store the role uid
  - service_type_replace:
    store the service type uid

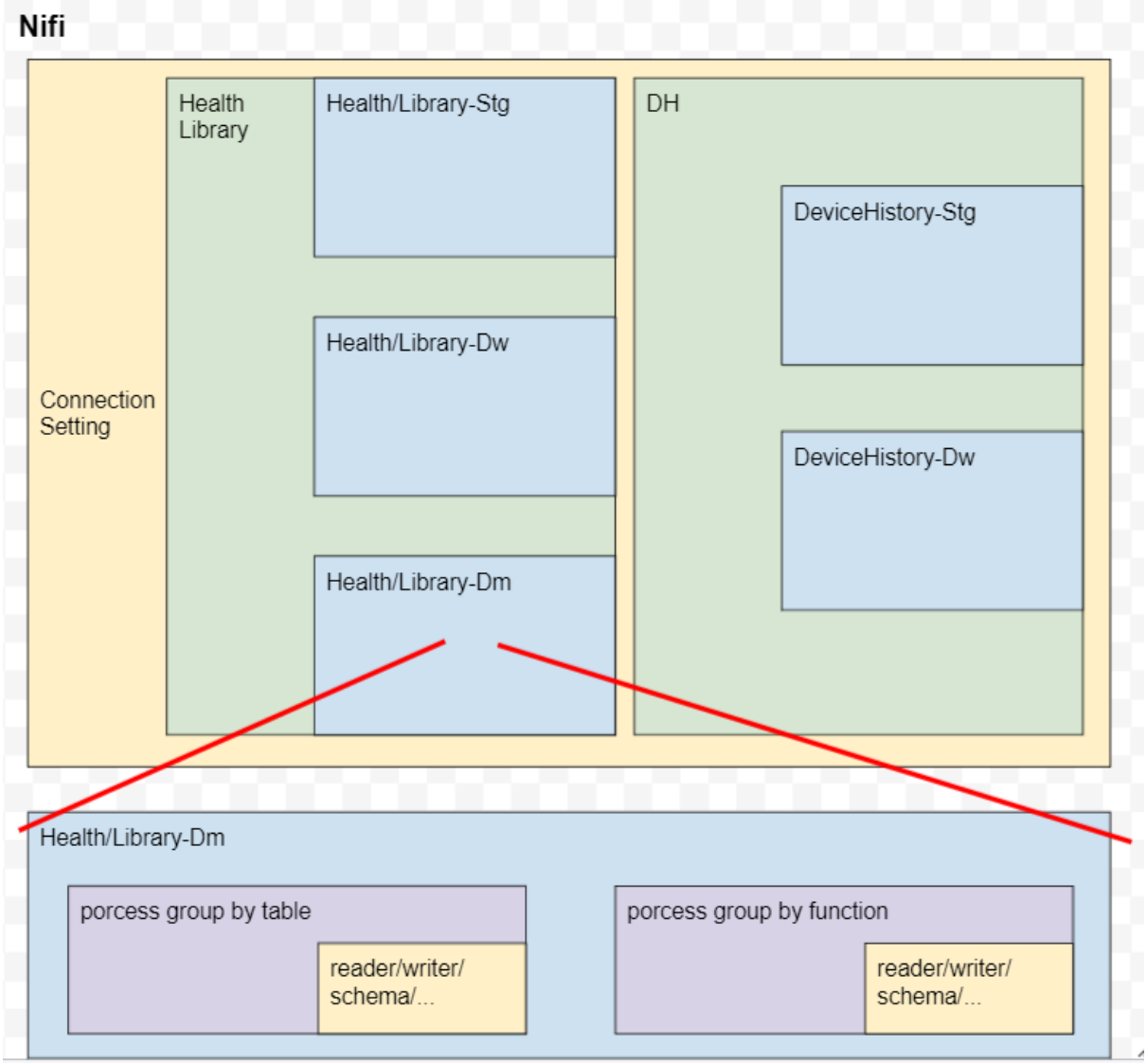
- symptom_replace:
  store the symptom uid
- treatment_replace:
  store the treatment uid

04_Nifi Deployment

Nifi Design Framework

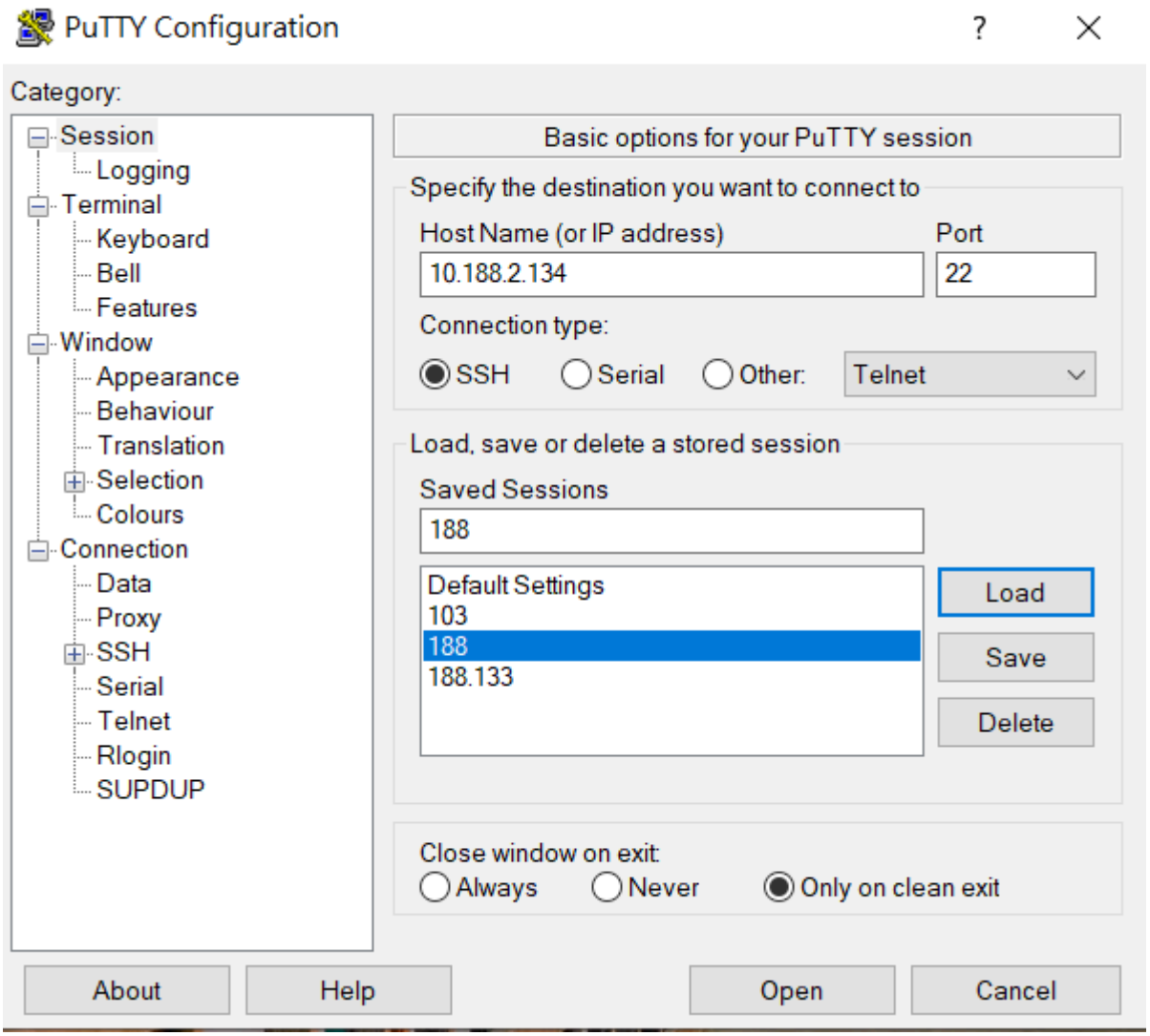
connection setting is globally applied.

reader/writer/schema is applied module by module.



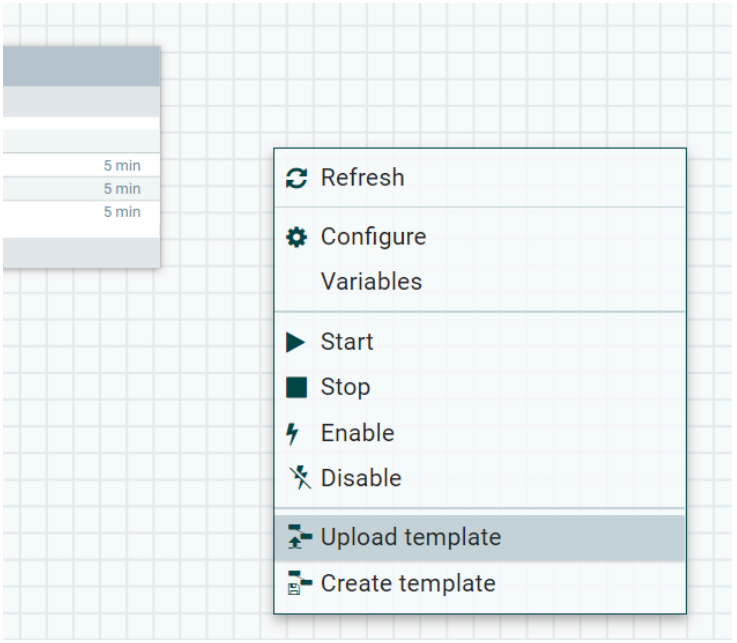
Import Template Into Nifi

1. using PuTTy connects to VM @----

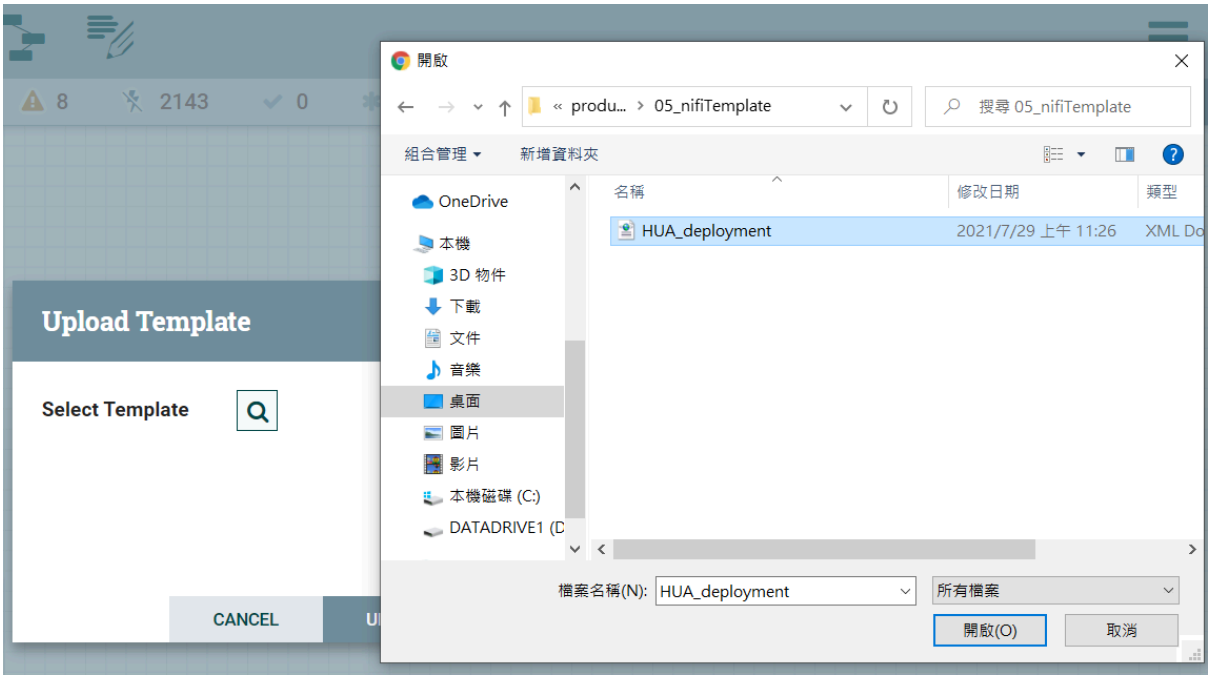


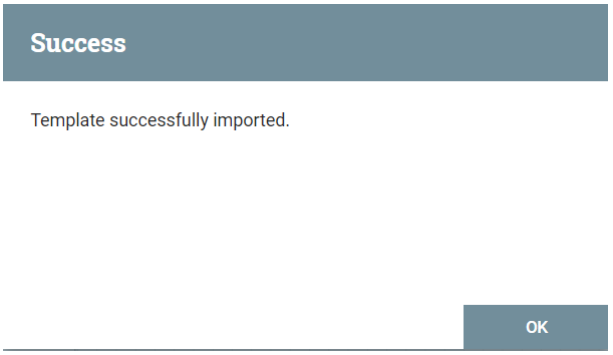
2. enter cridential:
   Account: tc8user / Password: mitac@123
3. check if nifi is running:
   nifi-1.10.0/bin/nifi.sh status
4. if not running:
   nifi-1.10.0/bin/nifi.sh start
5. open browser and type in link:
   http://10.188.2.134:8081/nifi/
6. upload template HUA_deployment.XML from folder 05_nifiTemplate

right click on blank space and select upload template

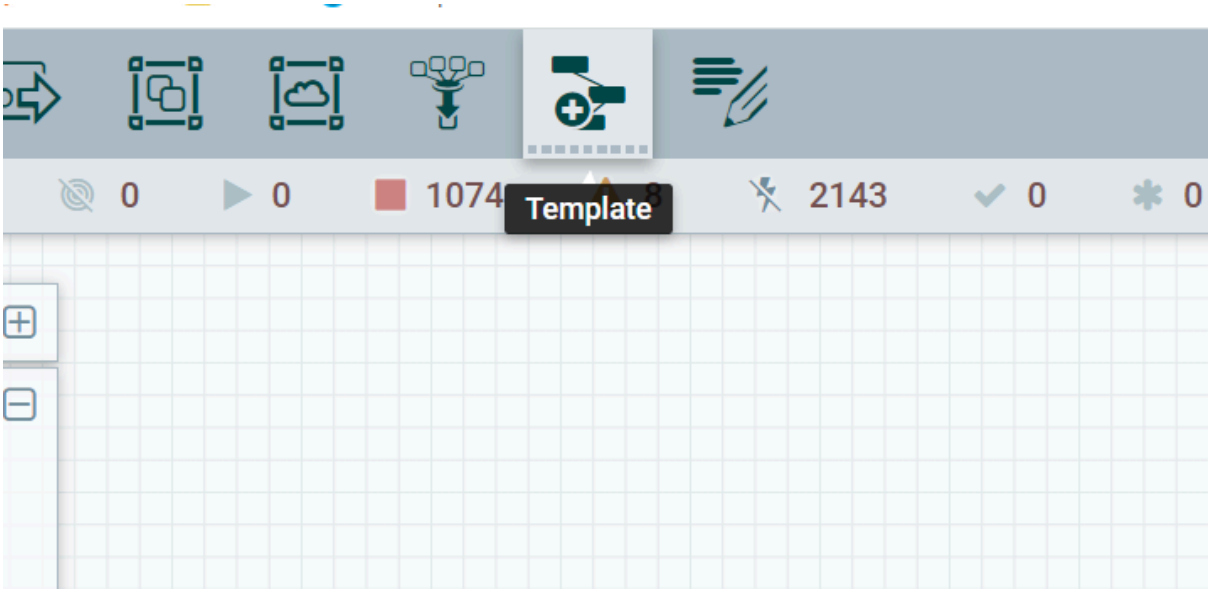


7. select HUA_deployment.XML and upload

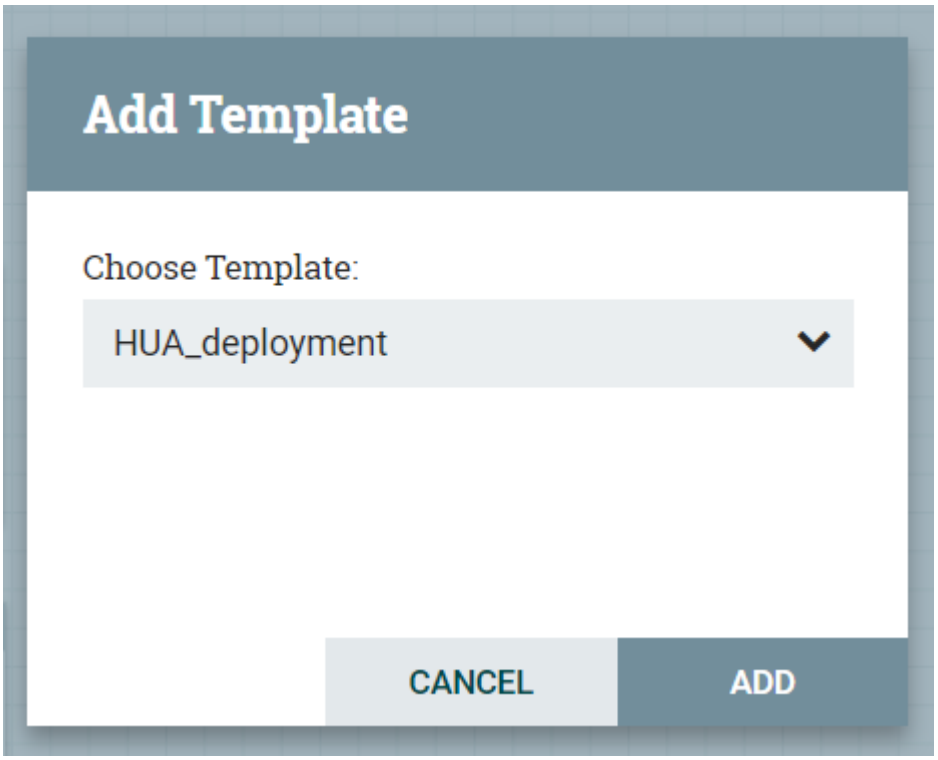




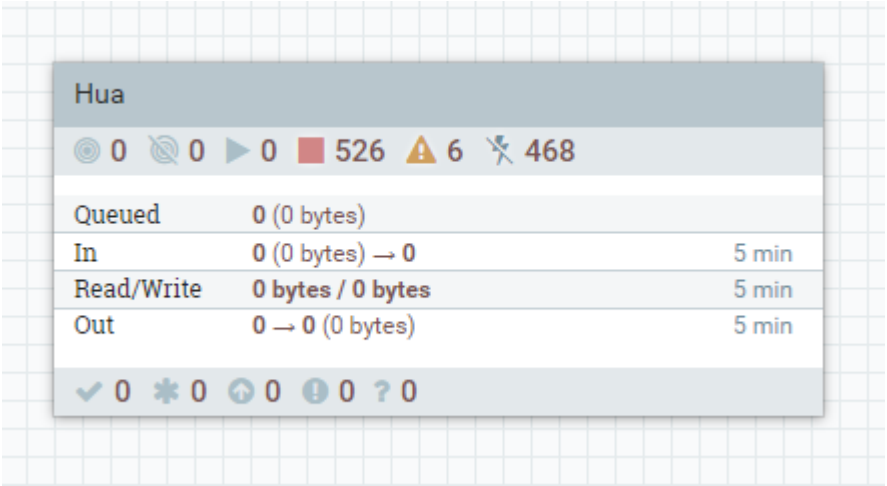
8. drag template icon to the blank space



9. choose template: HUA_deployment and click ADD

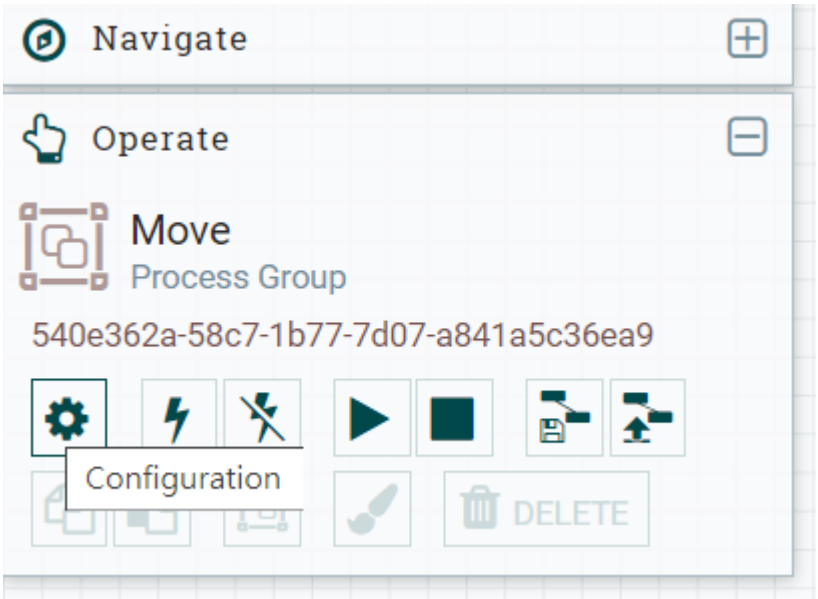


10. HUA_deployment will show up



Modify Connection Setting

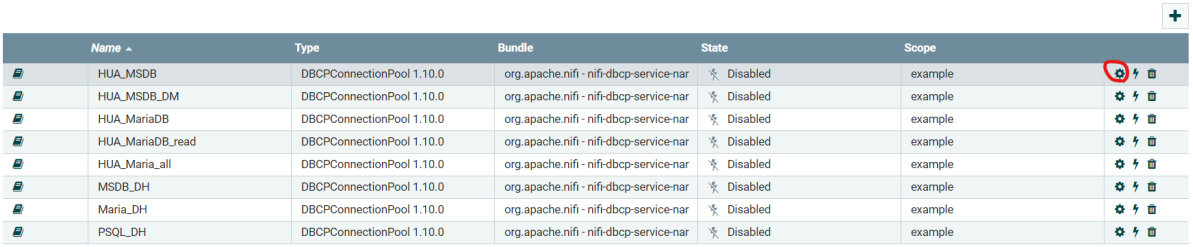
1. left click blank space and click the setting



2. click CONTROLLER SERVICES index

Name	Type
HUA_MSDB	DBCPConnectionPool 1.10.0
HUA_MSDB_DM	DBCPConnectionPool 1.10.0
HUA_MariaDB	DBCPConnectionPool 1.10.0
HUA_MariaDB_read	DBCPConnectionPool 1.10.0
HUA_Maria_all	DBCPConnectionPool 1.10.0
MSDB_DH	DBCPConnectionPool 1.10.0
Maria_DH	DBCPConnectionPool 1.10.0
PSQL_DH	DBCPConnectionPool 1.10.0

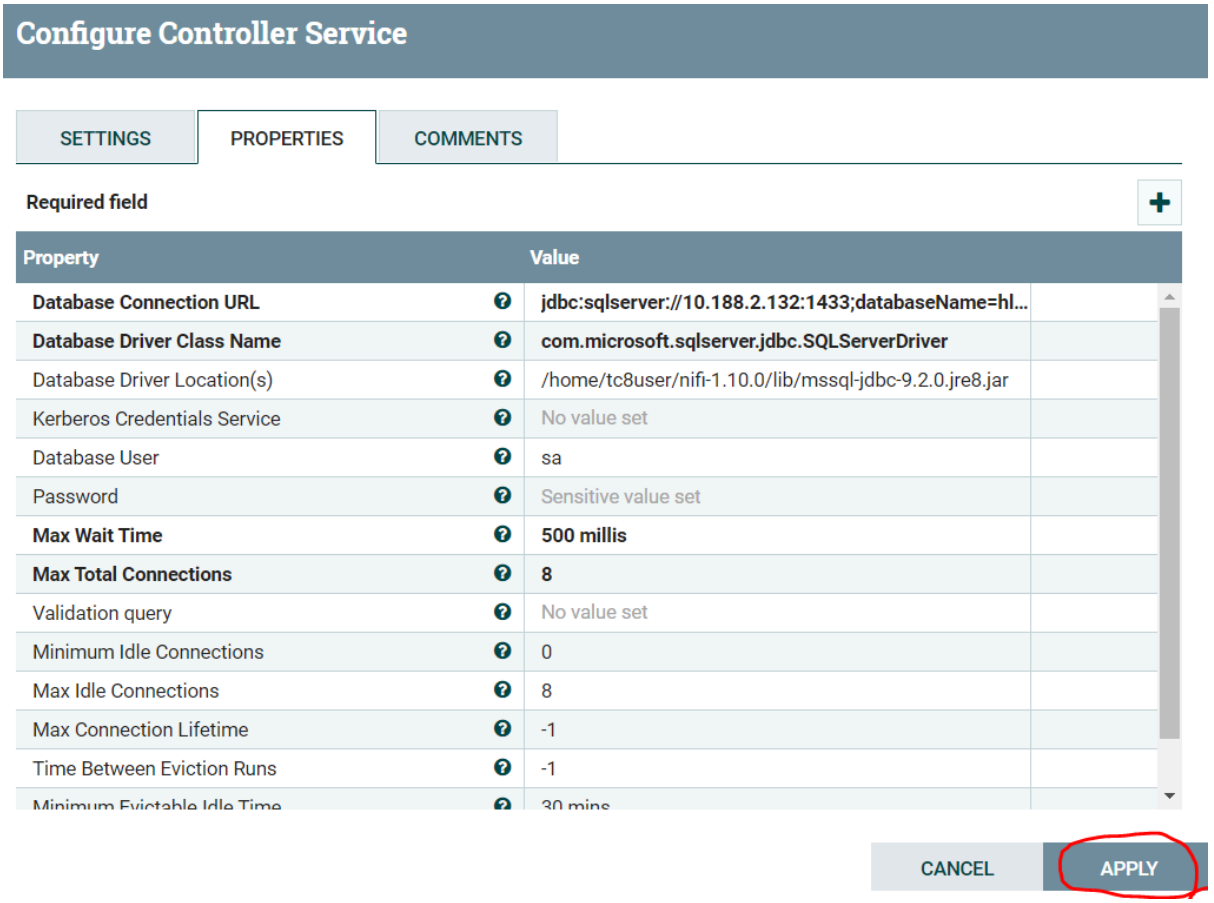
3. configure the connecting setting for each controller service by click the setting



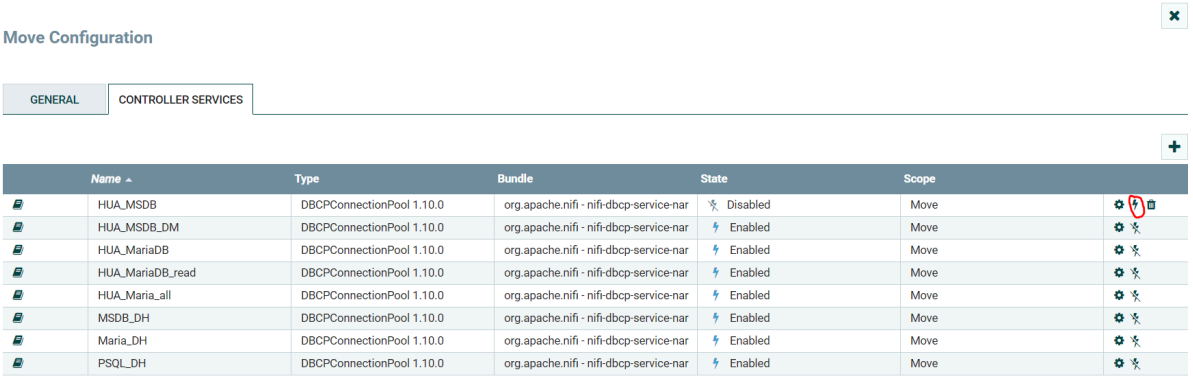
Name	Type	Bundle	State	Scope
HUA_MSDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
HUA_MSDB_DM	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
HUA_MariaDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
HUA_MariaDB_read	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
HUA_Maria_all	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
MSDB_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
Maria_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example
PSQL_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	example

4. configure Database Connection URL, Database Driver Class Name, Database Driver Location(s), Database User and Password

5. click apply after fill up those Properties



6. enable the controller service



7. values for each controller service is shown below
   - MSDB
     - HUA_MSDB_DW:

       health+library data warehouse in MS SQL
       - Database Connection URL: jdbc:sqlserver://10.188.2.132:1433;databaseName=hlscdwdb_prod
       - Database Driver Class Name: com.microsoft.sqlserver.jdbc.SQLServerDriver

- Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mssql-jdbc-9.2.0.jre8.jar
- Database User: mitacmssql
- Password: mitac@12345

- HUA_MSDB_DM:

  health+library data mart in MS SQL
  - Database Connection URL: jdbc:sqlserver://10.188.2.132:1433;databaseName=hlscdwdb_dm_prod
  - Database Driver Class Name: com.microsoft.sqlserver.jdbc.SQLServerDriver
  - Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mssql-jdbc-9.2.0.jre8.jar
  - Database User: mitacmssql
  - Password: mitac@12345

- MSDB_DH:

  health+library data warehouse in MS SQL
  - Database Connection URL: jdbc:sqlserver://10.188.2.132:1433;databaseName=hlscdwdb_dh_prod
  - Database Driver Class Name: com.microsoft.sqlserver.jdbc.SQLServerDriver
  - Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mssql-jdbc-9.2.0.jre8.jar

- Database User: mitacmssql
- Password: mitac@12345

- MariaDB
  - Maria_DH:

    devices history staging data in MariaDB
    - Database Connection URL: jdbc:mariadb://10.188.2.132:3306/stg_hlscdwdb_dh_dev
    - Database Driver Class Name: org.mariadb.jdbc.Driver
    - Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mariadb-java-client-2.7.2.jar
    - Database User: mitacmysql
    - Password: mitac@12345
  - Maria_Health_RAW:

    health staging data in MariaDB
    - Database Connection URL: jdbc:mariadb://10.188.2.132:3306/db_micampus
    - Database Driver Class Name: org.mariadb.jdbc.Driver
    - Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mariadb-java-client-2.7.2.jar
    - Database User: mitacmysql
    - Password: mitac@12345
  - Maria_Health_STG:

    health staging data in MariaDB

- Database Connection URL: jdbc:mariadb://10.188.2.132:3306/stg_micampus
- Database Driver Class Name: org.mariadb.jdbc.Driver
- Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mariadb-java-client-2.7.2.jar
- Database User: mitacmysql
- Password: mitac@12345

○ Maria_Library_RAW:

library staging data in MariaDB

- Database Connection URL: jdbc:mariadb://210.240.39.11:3306/
- Driver Class Name: org.mariadb.jdbc.Driver
- Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mariadb-java-client-2.7.2.jar
- Database User: bigdata
- Password: 1qaz@WSX

○ Maria_Library_STG:

all raw data and staging data in MariaDB

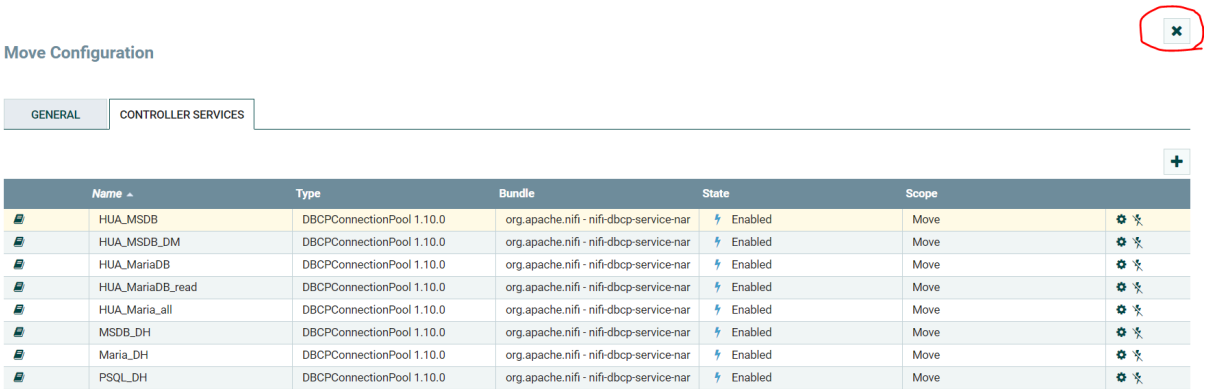
- Database Connection URL: jdbc:mariadb://10.188.2.132:3306/stg_interreads
- Database Driver Class Name: org.mariadb.jdbc.Driver
- Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/mariadb-java-client-2.7.2.jar

- Database User: mitacmysql
- Password: mitac@12345

- PostgreSQL
  - PSQL_DH:

    devices history raw data in PostgreSQL
    - Database Connection URL: jdbc:postgresql://10.188.2.133:5432/
    - Database Driver Class Name: org.postgresql.Driver
    - Database Driver Location(s): /home/tc8user/nifi-1.10.0/lib/postgresql-42.2.22.jar
    - Database User: postgres
    - Password: mitac@123

8. close the Configuration after all the controller services are configured and enabled

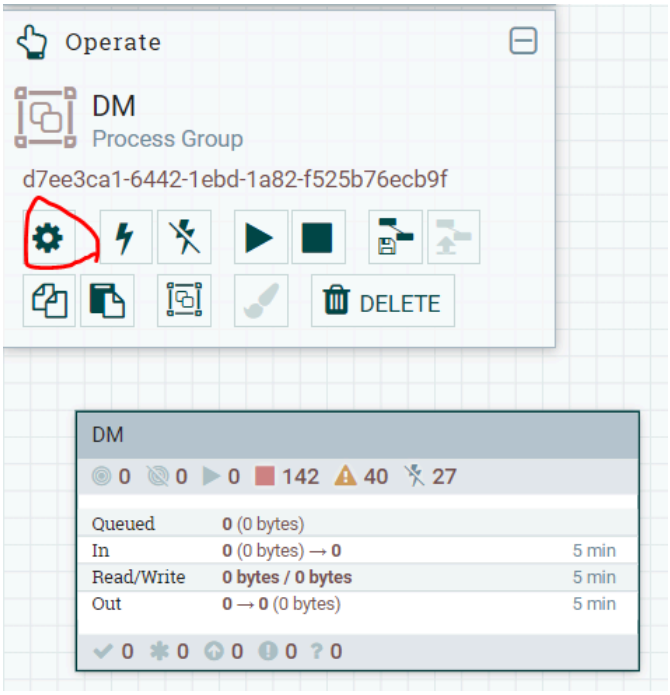


Enable All Controller Service

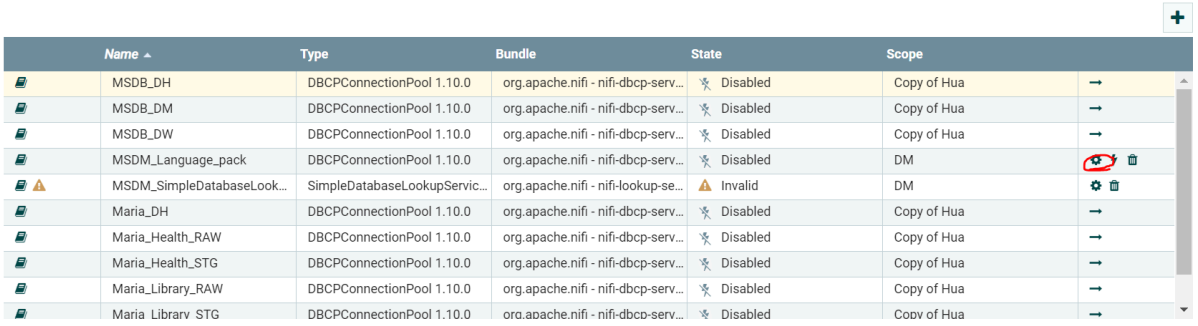
Left click on each process group and the process groups that are embedded in them and click the setting icon to enable all the controller service.

Example:

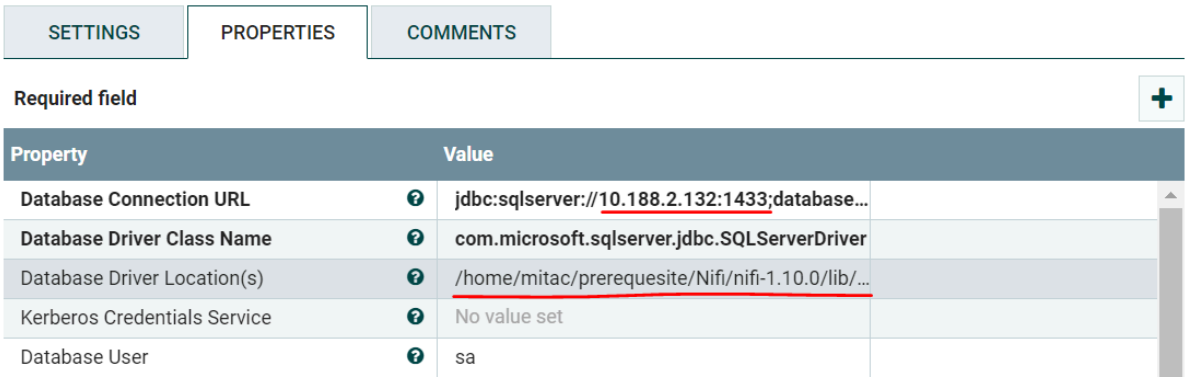
1. left click on process group DM and click the setting icon.



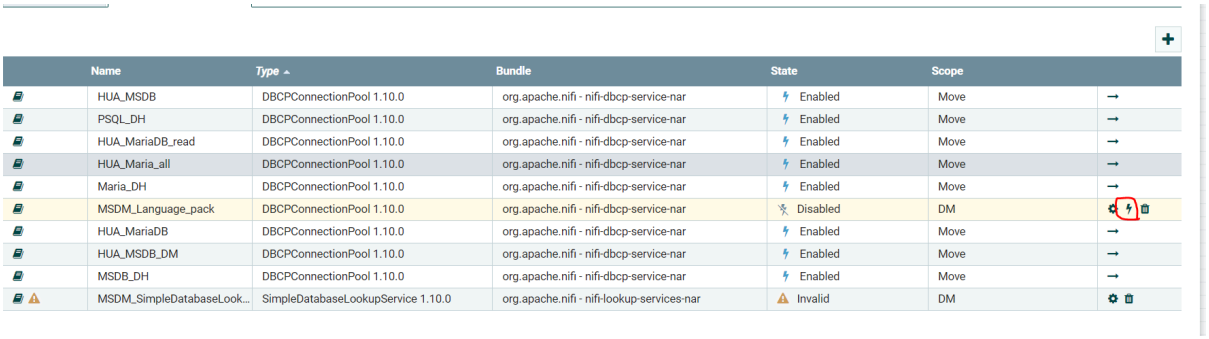
2. click the setting button



3. make necessary changes

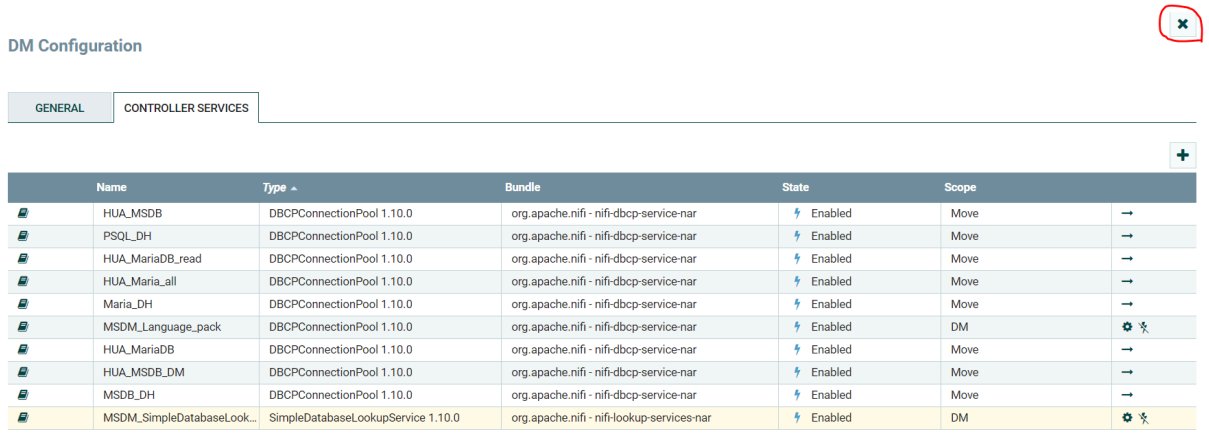


4. click the lighting icon to enable the controller services



Name	Type	Bundle	State	Scope
HUA_MSDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
PSQL_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_MariaDB_read	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_Maria_all	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
Maria_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDM_Language_pack	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Disabled	DM
HUA_MariaDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_MSDB_DM	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDB_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDM_SimpleDatabaseLook...	SimpleDatabaseLookupService 1.10.0	org.apache.nifi - nifi-lookup-services-nar	Invalid	DM

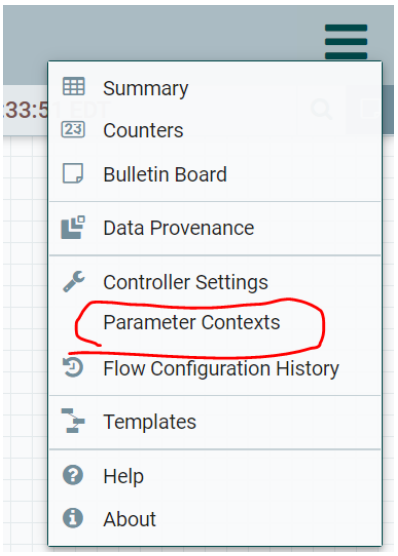
5. close the DM Configuration window



Name	Type	Bundle	State	Scope
HUA_MSDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
PSQL_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_MariaDB_read	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_Maria_all	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
Maria_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDM_Language_pack	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	DM
HUA_MariaDB	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
HUA_MSDB_DM	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDB_DH	DBCPConnectionPool 1.10.0	org.apache.nifi - nifi-dbcp-service-nar	Enabled	Move
MSDM_SimpleDatabaseLook...	SimpleDatabaseLookupService 1.10.0	org.apache.nifi - nifi-lookup-services-nar	Enabled	DM

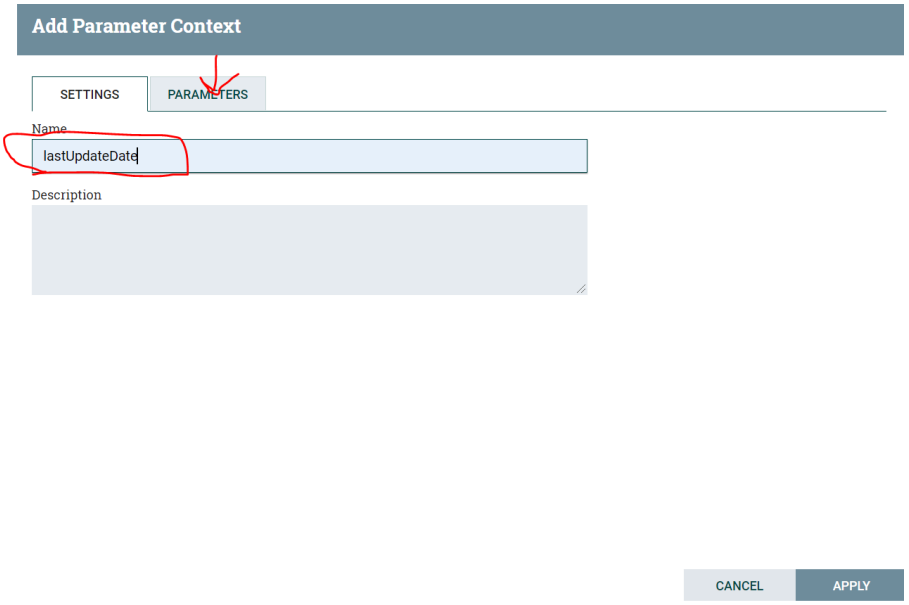
6. repeat process 1-5 for all the process groups below.
   All the process groups and the changes need to be made are shown below:
   - Parameter Contexts

- Click Pareameter Contexts



- Click the plus sign

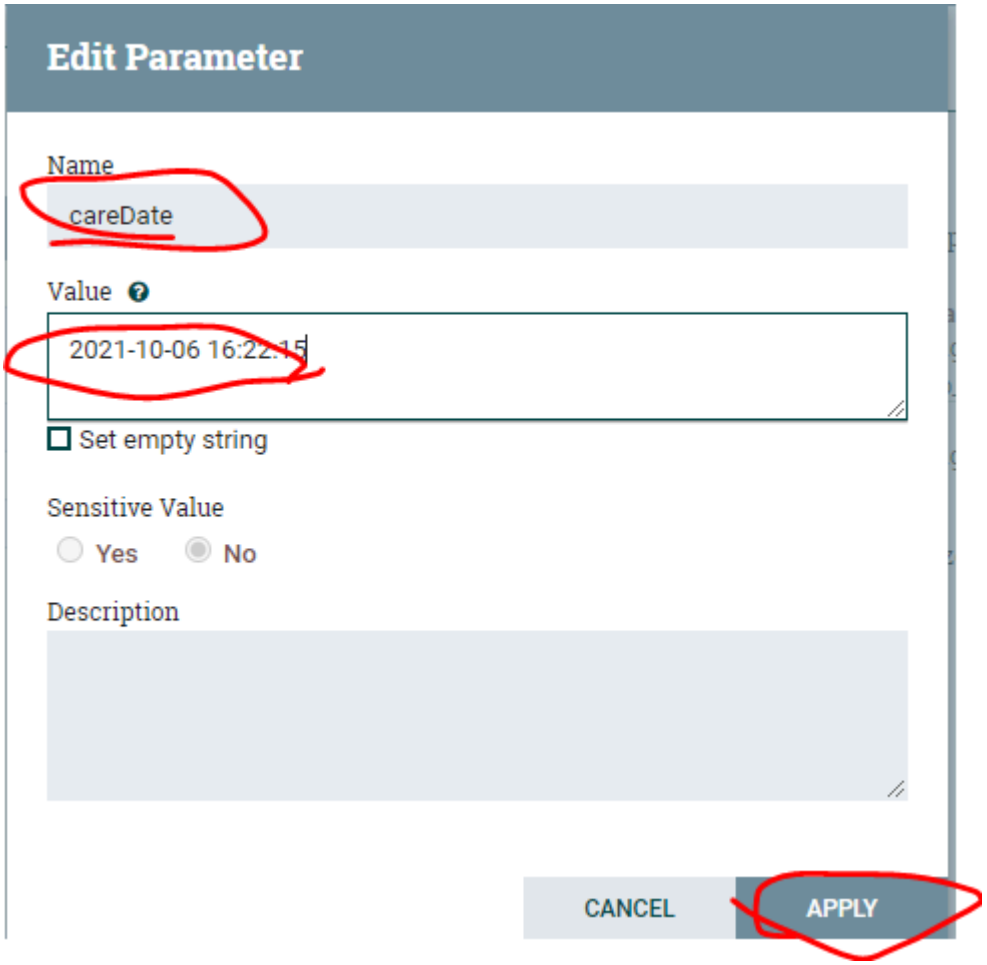
- Under SETTINGS tag, enter lastUpdateDate in Name, and click PARAMETERS tag.



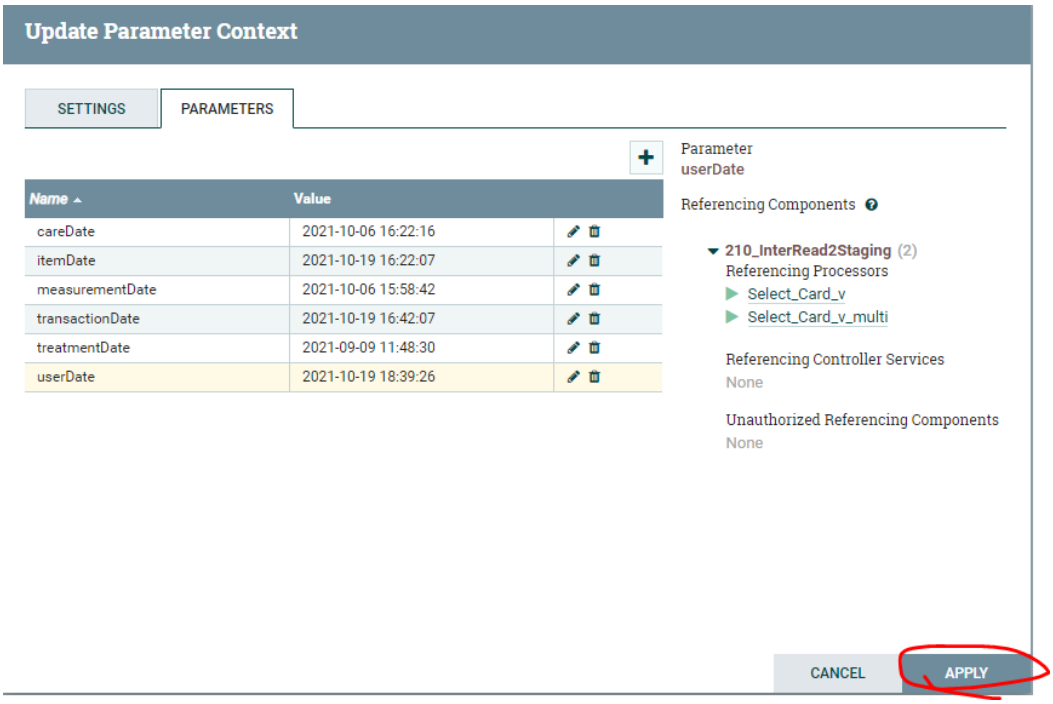
- Click the plus sign and enter the name and check the Set empty String box, then click apply. Repeat this step for all the names below:
  - careDate
  - itemDate
  - measurementDate

- transactinDate
- treatementDate
- userDate

- set value:
  - max last_update_date for tables: stg_tb_item_info/ stg_tb_transaction_info/ stg_tb_user_info in MaraiDB
  - max registeredAt for tables: stg_tb_care_data/ stg_tb_measurement_data/ stg_tb_treatment_data in MaraiDB
-



- Click apply once set up all the PARAMETERS



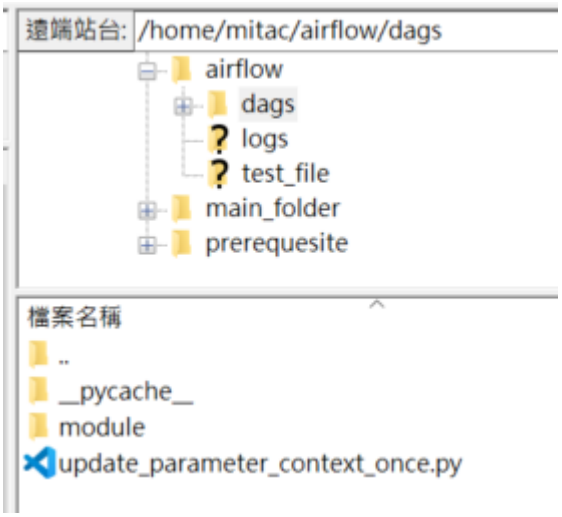
- Hua
  - Modify connection setting
  - Connection Strings have been provided in 04_Nifi Deployment
- HuaProject/STG/132_MiHealth2Staging
  - Enable all the controller service
  - Under general tag, change Process Group Parameter Context to lastUpdateDate
- HuaProject/STG/210_InterRead2Staging
  - Enable all the controller service
  - Under general tag, change Process Group Parameter Context to lastUpdateDate
- DW/update_library_card_number
  - Enable all the controller service
- DW/updating_users
  - Enable all the controller service
- DW/updating_clinic_records
  - Enable all the controller service
- DW/updating_measure_records
  - Enable all the controller service
- DW/updating_treatment_records
  - Enable all the controller service

- DW/updating_item_info
  - Enable all the controller service
- DW/updating_transaction_info
  - Enable all the controller service
- DW/test_set_dat_upload
- DM
  - MSDM_Language_pack
    - Database Connection URL
      jdbc:sqlserver://10.188.2.132:1433;databaseName=test4_hlscdwdb_dm_dev
    - Database Driver Location(s)
      /home/mitac/prerequesite/Nifi/nifi-1.10.0/lib/mssql-jdbc-9.2.0.jre8.jar
    - Database User
      sa
    - Password
      mitac
  - Enable all the controller service
- DM/health_dimensions
  - Enable all the controller service
- DM/user_info_dms
  - Enable all the controller service
- DM/health_dms
  - Enable all the controller service
- DM/health_dms/dm_health_record
  - Enable all the controller service
- DM/library_dms
  - Enable all the controller service
- DM/library_dms/dms_book
  - Enable all the controller service
- DM/library_dms/dms_transaction
  - Enable all the controller service
- Device_dev
  - Enable all the controller service
- Device_dev/STG
  - Enable all the controller service
- Device_dev/DW

- Enable all the controller service

Set Up Python Script for Parameter Contexts

1. Copy and paste the prerequisite



   - Folder:

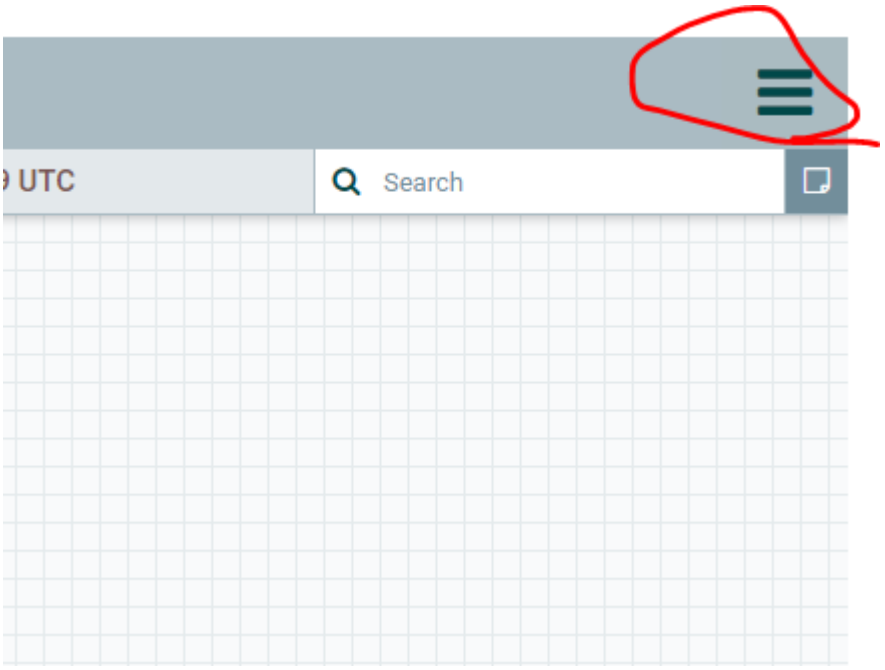
     04_mainFolder/dags

   - Target path:

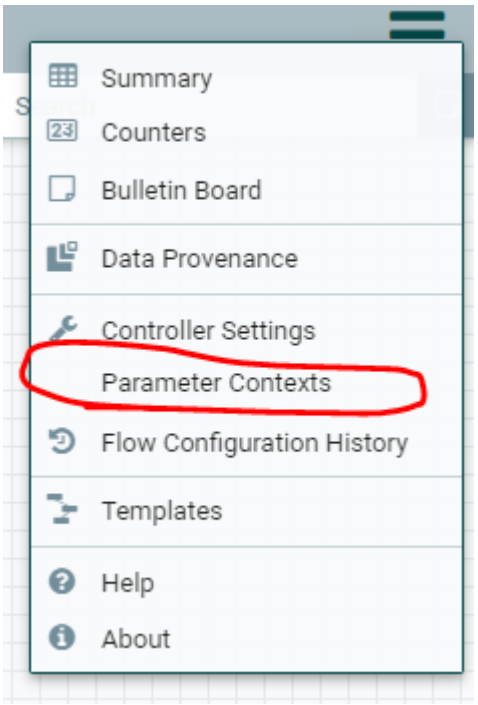
     /home/----/airflow/

2. Collecting the value for the following variables:
   (use %40 to represent @)
   - connection string for Maria_Library_RAW:
     - mitacnifi:mitac%4012345@10.11.10.132
   - connection string for Maria_Health_RAW
     - mitacnifi:mitac%4012345@10.11.10.132
   - ParameterContext_Id

1. Click the right top

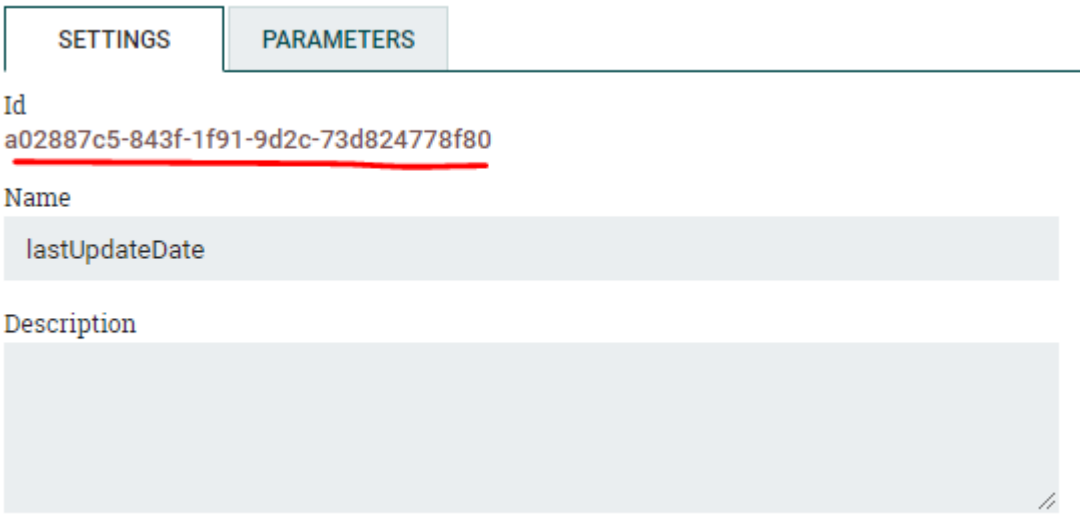


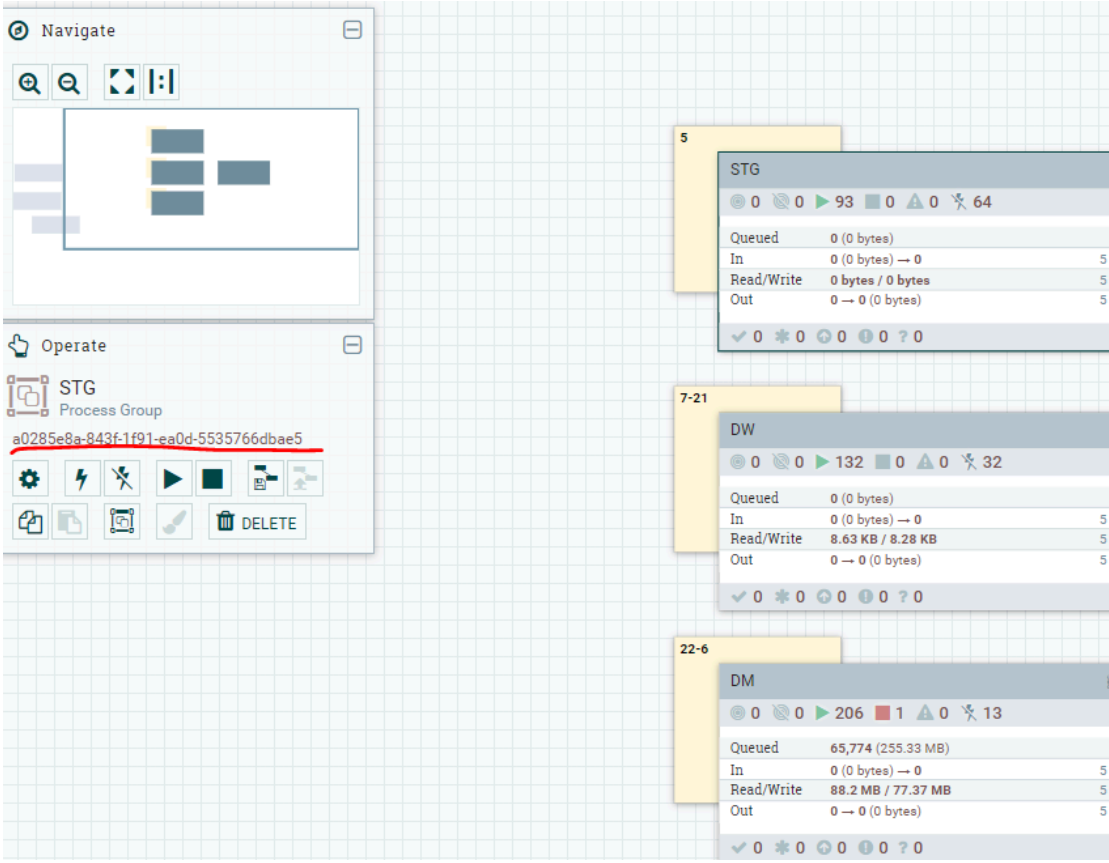
2. Click Parameter Contexts



3. Click edit for lastUpdateDate

4. The parameter context id is under the setting tag



- STG_Process_Group_Id:
  - left click on STG process group
  - 

- Nifi_Host:
  format: Nifi's host
  e.g. :10.188.2.134

3. Edit Parameter Portion of the pipeline_monitor.py file under the path /home/mitac/airflow/dags/module
    - e.g.

```
# Parameter Portion Begin ================================================

Maria_Library_RAW_Connection_String = "root:mitac@10.188.2.132"
Maria_Health_RAW_Connection_String = "root:mitac@10.188.2.132"
ParameterContext_Id = 'a02887c5-843f-1f91-9d2c-73d824778f80'
STG_Process_Group_Id = 'a0285e8a-843f-1f91-ea0d-5535766dbae5'
Nifi_Host ='10.188.2.134'

# Parameter Portion End ==================================================
```

Set Up Python Script for Nifi

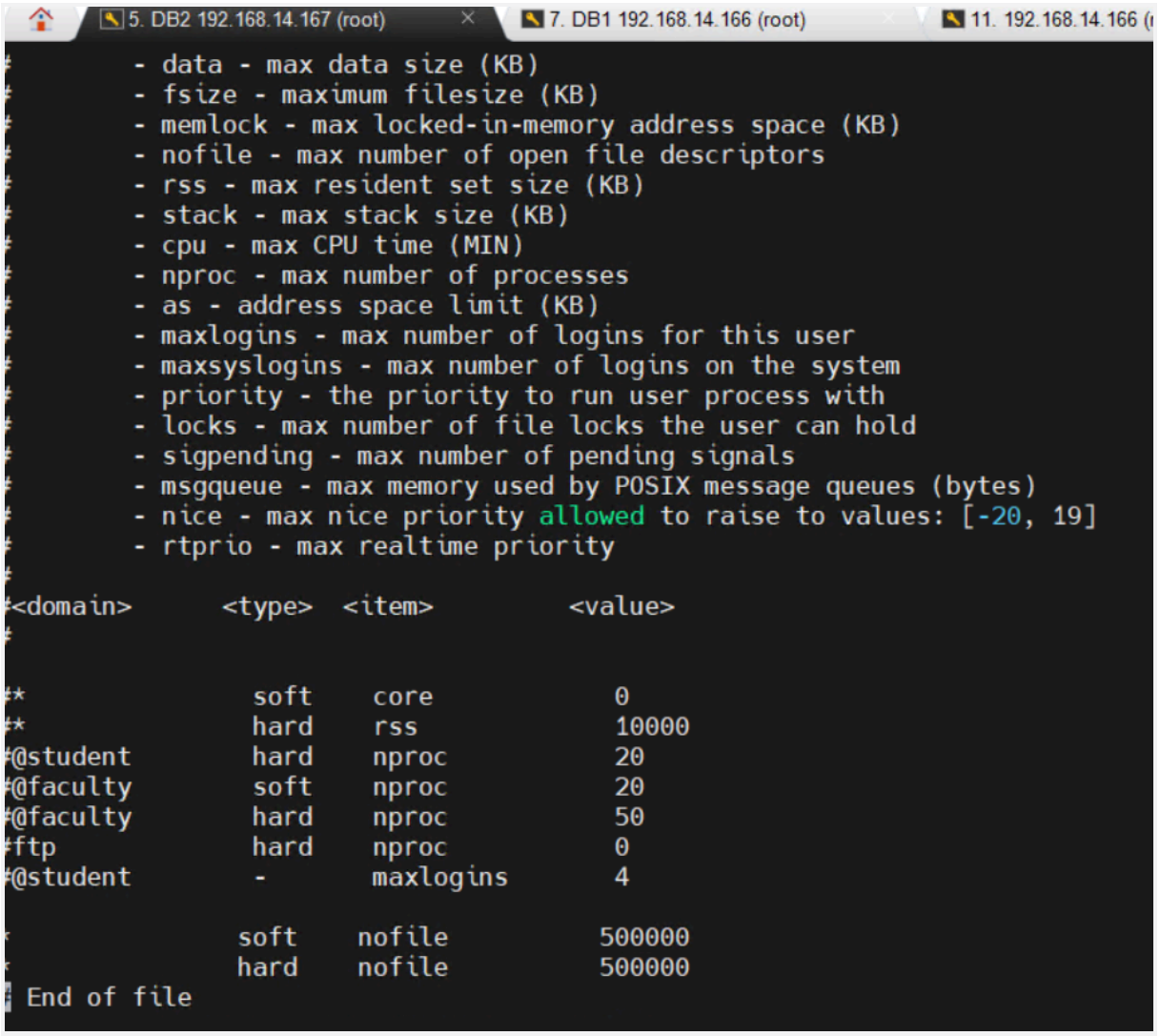
1. Change the path to: /----/main_folder/replace for the files below:
   update_injured_part.py
   update_location.py
   update_role.py
   update_service_type.py
   update_symptom.py
   update_treatment.py
2. example:

```
#!/usr/bin/python3.6
# # Parameter Portion Begin ================================================
path = '/home/tc8user/main_folder/replace'



# Coding Portion end =====================================================
```

05_CentOS資源設定

Increase “Open Files Limit”

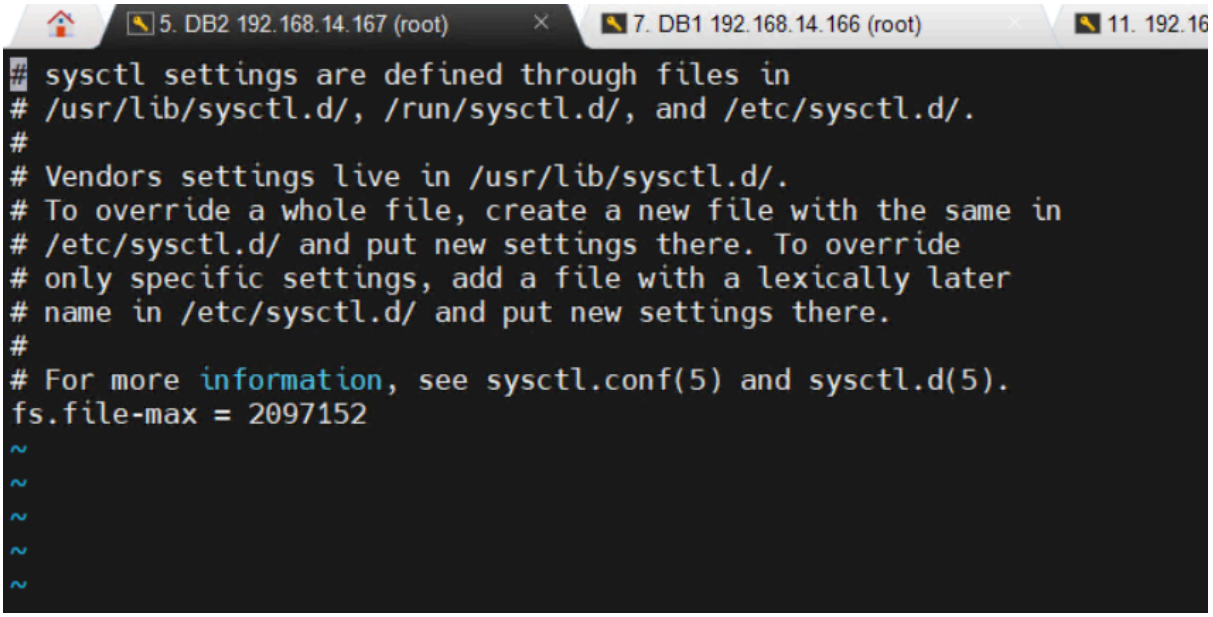
- Per-User Limit
  1. Open file:
     sudo vi /etc/security/limits.conf
  2. Paste following towards end:
     - ❖ * hard nofile 500000
     - ❖ * soft nofile 500000



  3. Once you save the file, you may need to logout and login again.

- System-Wide Limit
  1. Open file:
     sudo vi /etc/sysctl.conf

2. Add following:
   - ❖ fs.file-max = 2097152



3. Once you save the file, check the modification by typing:
   `sysctl -p`
4. Reboot the system by typing:
   `reboot now`

06_STG/DW/DM/JOB排程

RAW to STG

please refer to NiFi Flow to match the names of process groups and processors.

132_MiHealth2Staging:

- Logic:
  a. init:
     get all the data from the source.
  b. daily
     #where
     take advantage of SQL syntax "where t.lastUpdated > '#{-----Date}'" to extract the data that had the last update date newer than the previous updating period.

- Targets:
  the following tables in **MariaDB** will be looked into:
  a. **db_micampus.***treatment_data*
  b. **db_micampus.***measurement_data*
  c. **db_micampus.***care_data*

- Desitnation:
  the following tables in **MariaDB** will be updated:
  a. **stg_micampus.***stg_tb_treatment_data*
  b. **stg_micampus.***stg_tb_measurement_data*
  c. **stg_micampus.***stg_tb_care_data*

- Frequency:
  a. init:
     only run once when starts a new staging db
  b. daily:
     0 0 5 * * ?

210_InterRead2Staging

- Logic:
  a. init:
     get all the data from the source.
  b. daily
     #where
     take advantage of SQL syntax "where t.lastUpdated > '#{XXXXXDate}'" to extract the data that had the last update date newer than the previous updating period.

- Targets:
  the following tables under each school's DB in **MariaDB** will be looked into:
  a. **dbsettings._XXXXX.***transaction_info_vX*
  b. **dbsettings._XXXXX.***items_info_vX*
  c. **dbsettings._XXXXX.***patron_info*_vX

- Desitnation:
  the following tables in **MariaDB** will be updated:
  a. **stg_micampus.***stg_tb_transaction_info*
  b. **stg_micampus.***stg_tb_item_info*
  c. **stg_micampus.***stg_tb_user_info*

- Frequency:
  a. init:
     only run once when starts a new staging db
  b. daily:
     0 0 5 * * ?

STG to DW

the assigned frequency

updating_library_card_number:

- Logic:
  #except #reference_table
  take advantage of SQL syntax "except" to extract the difference between **MariaDB** *stg_interreads.stg_tb_user_info and* **MariaDB stg_interreads**.*dim_tb_card_number* into the destination table in **MS SQL hlscdwdb_dev**.*dim_tb_card_number*, then update the reference table **MariaDB stg_interreads**.*dim_tb_card_number*.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_interreads**.*stg_tb_user_info*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dev.***dim_tb_card_number*

- Frequency:
  0 */5 7-21 * * ?

updating_users:

- Logic:
  #except #reference_table
  take advantage of SQL syntax "except" to extract the difference between **MariaDB stg_interreads**.*stg_tb_user_info and* **MariaDB stg_interreads**.*stg_tb_user_info_ref* into a temp table in **MariaDB stg_interreads**.*stg_tb_user_info_ref_temp*, insert data from the temp table into the destination table in **MS SQL hlscdwdb_dev.***fat_tb_user*, then update the reference table **MariaDB stg_interreads**.*stg_tb_user_info_ref*.

- Targets:
  the following table in **MariaDB** will be looked into:

a. **stg_interreads**.*stg_tb_user_info*

- Desitnation:
  in **MariaDB**
  a. **stg_interreads**.*stg_tb_user_info_ref*
  in **MS SQL**
  b. **hlscdwdb_dev.***fat_tb_user*

- Frequency:
  0 */5 7-21 * * ?

updating_clicnic_records:

- Logic:
  #flag #batch
  record the process time, extract at most 1000 rows with flag as 0 from table in **MariaDB stg_micampus.***stg_tb_care_data*, assign a batch number to them, and modify the flag to 1 after selecting.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_micampus.***stg_tb_care_data*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dev.***fat_tb_clinic_record*

- Frequency:
  20 */2 7-21 * * ?

updating_measure_records:

- Logic:
  #flag #batch
  record the process time, extract at most 1000 rows with flag as 0 from table in **MariaDB stg_micampus.***fat_tb_health_record*, assign a batch number to them, and modify the flag to 1 after selecting.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_micampus.***stg_tb_measurement_data*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dev.***fat_tb_health_record*

- Frequency:
  20 */2 7-21 * * ?

updating_treatment_records:

- Logic:
  #flag #batch
  record the process time, extract at most 1000 rows with flag as 0 from table in **MariaDB stg_micampus.***stg_tb_treatment_data*, assign a batch number to them, and modify the flag to 1 after selecting.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_micampus.***stg_tb_treatment_data*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dev.***fat_tb_treatment_record*

- Frequency:
  20 */2 7-21 * * ?

updating_item_info:

- Logic:
  #flag #batch
  record the process time, extract at most 1000 rows with flag as 0 from table in **MariaDB stg_interreads.***stg_tb_item_info*

, assign a batch number to them, and modify the flag to 1 after selecting.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_interreads.***stg_tb_item_info*

- Desitnation:
  in **MS SQL**
  b. **hlscdwdb_dev.***fat_tb_item_info*

- Frequency:
  40 */2 7-21 * * ?

updating_transaction_info:

- Logic:
  #flag #batch
  record the process time, extract at most 1000 rows with flag as 0 from table in **MariaDB stg_interreads.***stg_tb_transaction_info*, assign a batch number to them, and modify the flag to 1 after selecting.

- Targets:
  the following table in **MariaDB** will be looked into:
  a. **stg_interreads.***stg_tb_transaction_info*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dev.***fat_tb_transaction_info*

- Frequency:
  40 */2 7-21 * * ?

DW to DM

health_dimensions.*:

- Logic:
  #except #reference_table #csv
  reading csv files into reference tables in **MS SQL hlscdwdb_dm_dev**, take advantage of SQL syntax "except" to extract the difference from the reference table into the destination table in **MS SQL hlscdwdb_dm_dev** then clean the reference tables.

- Targets:
  the following csv files under the path **/home/----/main_folder/replace** on VM will be looked into:
  a. injured_part_replace.csv
  b. location_replace.csv
  c. symptom_replace.csv
  d. treatment_replace.csv
  e. service_type_replace.csv

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***tb_role*
  b. **hlscdwdb_dm_dev.***tb_injured_part*
  c. **hlscdwdb_dm_dev.***tb_location*
  d. **hlscdwdb_dm_dev.***tb_symptom*
  e. **hlscdwdb_dm_dev.***tb_treatment*
  f. **hlscdwdb_dm_dev.***tb_service_type*

- Frequency:
  0 0 21 * * ?

user_info_dms.dms_user_info:

- Logic:
  #flag #where
  extract at most 1000 rows updated at least 1 hour ago, mark the

flag in the flag column **userDm** to 0, transfer to DM, and after transfering to DM modify the flag to 1.

- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***fat_tb_user*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***dm_user_info*

- Frequency:
  0 */2 1,2,3,4,5,6,22,23,0 * * ?

user_info_dms.card_dms:

- Logic:
  #flag #where
  extract at most 1000 rows updated at least 1 hour ago, mark the flag in the flag column **cardDm** to 0, transfer to DM, and after transfering to DM modify the flag to 1.

- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***dim_tb_card_number*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***dm_card_id*

- Frequency:
  0 */2 1,2,3,4,5,6,22,23,0 * * ?

health_dms.*:

- Logic:
  #check #flag #batch #where
  record the process time, extract at most 1000 rows updated at

least 1 hour ago with the minimum batchNo, mark the flag in the check table **hlscdwdb_dev.***ck_tb_clinic_record* to 0, join multiple tables, transfer to DM, and after transfering to DM modify the flag to 1.

- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***fat_tb_health_record*
  b. **hlscdwdb_dev.***fat_tb_clinic_record*
  c. **hlscdwdb_dev.***fat_tb_treatment_record*
  d. **hlscdwdb_dev.***fat_tb_user*
  e. **hlscdwdb_dev.***dim_tb_card_number*
  f. **hlscdwdb_dev.***fat_tb_school*

- Desitnation:
  a. **hlscdwdb_dm_dev.***dm_health_record*
  b. **hlscdwdb_dm_dev.***dm_clinic_total*
  c. **hlscdwdb_dm_dev.***dm_surgery*
  d. **hlscdwdb_dm_dev.***dm_internal*
  e. **hlscdwdb_dm_dev.***dm_treatment*
  f. **hlscdwdb_dm_dev.***dm_location*
  g. **hlscdwdb_dm_dev.***dm_student_amount*

- Frequency
  a. **0 0 8 * * ?** for *dm_student_amount*
  b. 20 */1 1,2,3,4,5,6,22,23,0 * * ? for dm_health_record, dm_clinic_total, dm_surgery
  c. 40 */1 1,2,3,4,5,6,22,23,0 * * ? for dm_internal, dm_treatment, dm_location

library_dms.dms_book:

- Logic:
  #check #flag #batch #where
  record the process time, extract at most 1000 rows updated at least 1 hour ago with the minimum batchNo, mark the flag in the check table **hlscdwdb_dev.***ck_tb_book* to 0, transfer to DM, and

after transfering to DM modify the flag to 1.

- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***fat_tb_item_info*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***dm_book*

- Frequency:
  0 */1 1,2,3,4,5,6,22,23,0 * * ?

library_dms.dms_transaction.*:

- Logic:
  #check #flag #batch #where
  record the process time, extract at most 1000 rows updated at least 1 hour ago with the minimum batchNo, and mark the flag in the check table **hlscdwdb_dev.***ck_tb_transaction* to 0 and after transfering to DM modify the flag to 1.

- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***fat_tb_transaction_info*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***dm_transaction*

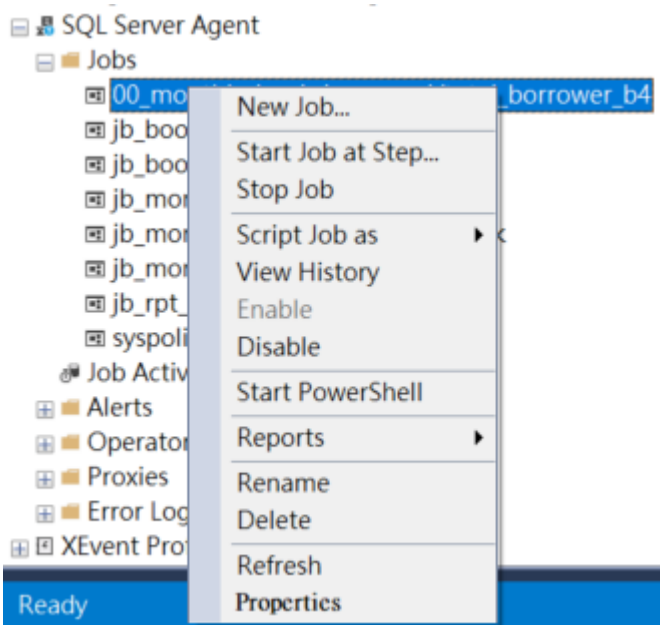
- Frequency:
  0 */1 1,2,3,4,5,6,22,23,0 * * ?

JOBs

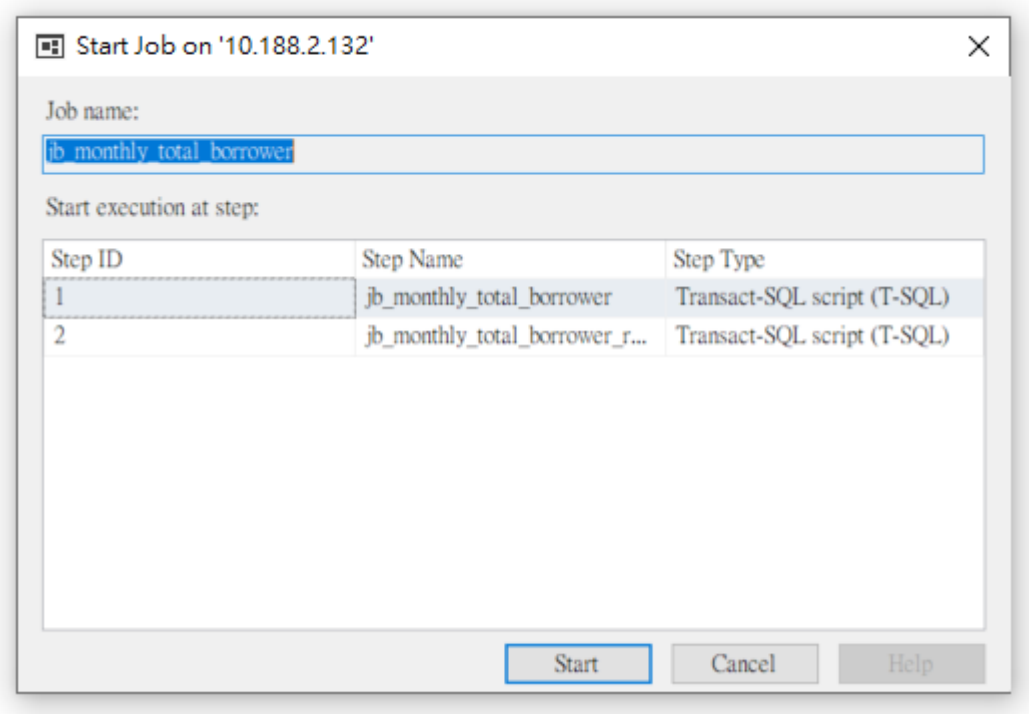
notice that the job **00_monthly_book_borrowed/total_borrower_b4** should be manually executed on the first time the production environment is created.

How to Execute a Job Manually:

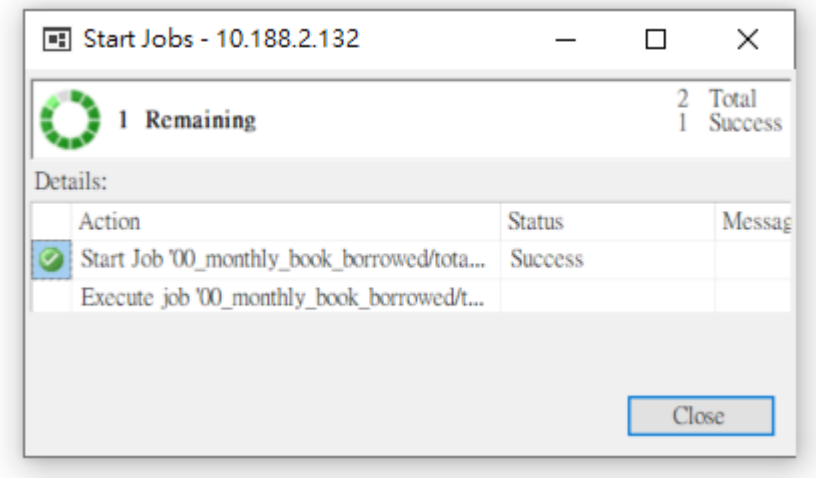
1. right click on the target job that should be executed.



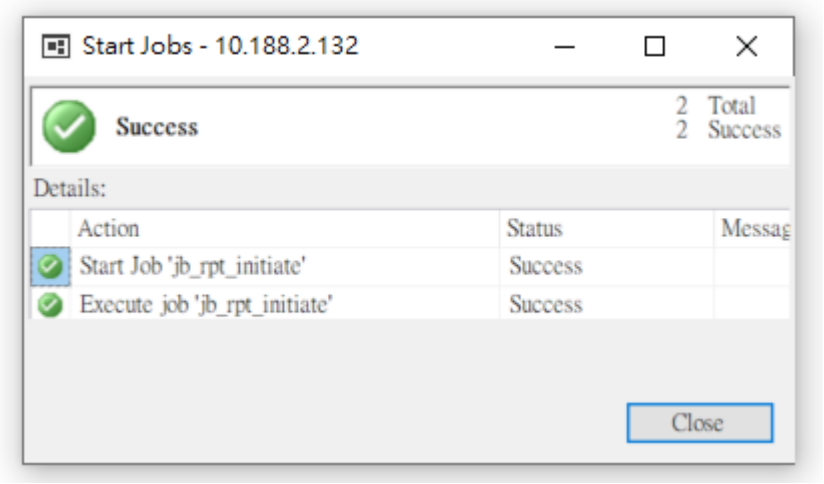
2. click Start Job at Step….. A window will pop up like something below:



3. click Start.
   A window will pop up like something below.



4. Once the job is done.
   It should look similar to the following:



00_monthly_book_borrowed&total_borrower_b4:

- Logic:
  #insert #calculate
  a. rpt_monthly_book_borrowed_for_past_year:
     以書本為單位,依照縣市級及鄉鎮市級分別計算過去12個月每個月的書本總借閱次數.(e.g.一個人借三本書,以三本計算)
  b. rpt_monthly_total_borrower_for_past_year
     以借閱者為單位,依照縣市級及鄉鎮市級分別計算過去12個月每個月的借閱人數.(e.g.一個人借三本書,以一人次計算)

- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dev.***vi_transaction*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_monthly_book_borrowed*
  b. **hlscdwdb_dm_dev.***rpt_monthly_total_borrower*

- Job frequency:
  once

-

01_jb_monthly_book_borrowed:

- Logic:
  #insert #calculate
  a. jb_monthly_book_borrowed:
     以書本為單位,依照縣市級及鄉鎮市級分別計算過去12個月每個月的書本總借閱次數.(e.g.一個人借三本書,以三本計算)
  b. jb_monthly_book_borrowed_rank:
     根據jb_monthly_book_borrowed
     的計算結果,依照縣市級、鄉鎮市級及校級分別計算當月的書本借閱次數PR值.
- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev***.vi_transaction*
  b. **hlscdwdb_dm_dev***.jb_monthly_book_borrowed*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_monthly_book_borrowed*
  b. **hlscdwdb_dm_dev.***rpt_monthly_book_borrowed_rank*

- Job frequency:
  06:00am on Sundays

02_jb_monthly_total_borrower:

- Logic:
  #insert #calculate
  a. jb_monthly_total_borrower:
     以借閱者為單位,依照縣市級及鄉鎮市級分別計算過去12個月每個月的借閱者總數.(e.g.一個人借三本書,以一人次計算)
  b. jb_monthly_total_borrower_rank:
     根據jb_monthly_total_borrower_rank的計算結果,依照縣市級、鄉鎮市級及校級分別計算當月的借閱者總數PR值.

- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev***.vi_transaction*

b. **hlscdwdb_dm_dev**.*jb_monthly_total_borrower*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_monthly_total_borrower*
  b. **hlscdwdb_dm_dev.***rpt_monthly_total_borrower_rank*

- Job frequency
  06:00am on Sundays

03_jb_monthly_book_per_person_rank:

- Logic:
  #insert #calculate
  a. jb_monthly_book_per_person_rank:
  以鄉鎮區,縣市為基準,分別計算最近三個月每月人均借閱冊數,並計算在鄉鎮區級及縣市級的PR值
  b. jb_update_cityAmount:
  計算該縣市的近三個月每月人均借閱冊數
- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev.***rpt_monthly_book_borrowed*
  b. **hlscdwdb_dm_dev.***rpt_monthly_total_borrower*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_monthly_book_per_person_rank*

- Job frequency:
  07:00am on Sundays

04_jb_book_cover:

- Logic:
  #insert
  a. insert directly from DW
- Targets:
  the following table in **MS SQL** will be looked into:

a. **testf1_hlscdwdb_dev**.*dim_tb_book_cover*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***dm_book_cover*
- Job frequency:
  02:00am on Sundays

05_jb_book_recommendation:

- Logic:
  #insert #calculate
  a. 將各校各年級的借閱紀錄(6個月內),依照書籍類別統計借閱數,取借閱數最高的前5類
  b. 取全縣各年級的借閱紀錄(6個月內)中,該5類排名第一的書籍(須排除掉該校原有的書籍, 只推薦該校館藏沒有的)

- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev.***vi_transaction*

- Desitnation:
  in **MS SQL**
  b. **hlscdwdb_dm_dev.***rpt_book_recommendation*

- Job frequency:
  07:00am on Sundays

06_jb_weekly_book_borrowed:

- Logic:
  #insert #calculate
  a. jb_weekly_book_borrowed:
  以書本為單位,依照縣市級及鄉鎮市級分別計算過去7天書本總借閱次數.(e.g.一個人借三本書,以三本計算)
  b. jb_weekly_book_borrowed_rank:
  根據jb_weekly_book_borrowed

的計算結果,依照縣市級、鄉鎮市級及校級分別計算當週的書本借閱次數PR值.

- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev**.*vi_transaction*
  b. **hlscdwdb_dm_dev**.*jb_weekly_book_borrowed*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_weekly_book_borrowed*
  b. **hlscdwdb_dm_dev.***rpt_weekly_book_borrowed_rank*

- Job frequency:
  06:00am on Sundays

07_jb_weekly_total_borrower:

- Logic:
  #insert #calculate
  a. jb_weekly_total_borrower:
  以借閱者為單位,依照縣市級及鄉鎮市級分別計算過去7天的借閱者總數.(e.g.一個人借三本書,以一人次計算)
  b. jb_weekly_total_borrower_rank:
  根據jb_weekly_total_borrower_rank的計算結果,依照縣市級、鄉鎮市級及校級分別計算當週的借閱者總數PR值.

- Targets:
  the following table in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev**.*vi_transaction*
  b. **hlscdwdb_dm_dev**.*jb_weekly_total_borrower*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_weekly_total_borrower*
  b. **hlscdwdb_dm_dev.***rpt_weekly_total_borrower_rank*

- Job frequency
  06:00am on Sundays

08_jb_weekly_book_per_person_rank:

- Logic:
  #insert #calculate
  a. **jb_week_book_per_person_rank**:
     以鄉鎮區,縣市為基準,分別計算最近一週人均借閱冊數,並計算在鄉鎮區級及縣市級的PR值
  b. **jb_update_cityAmount**:
     計算該縣市的最近一週人均借閱冊數
- Targets:
  the following tables in **MS SQL** will be looked into:
  a. **hlscdwdb_dm_dev.***rpt_weekly_book_borrowed*
  b. **hlscdwdb_dm_dev.***rpt_weekly_total_borrower*

- Desitnation:
  in **MS SQL**
  a. **hlscdwdb_dm_dev.***rpt_weekly_book_per_person_rank*

- Job frequency:
  07:00am on Sundays