

## Table of Contents

Table of Contents	1
ISSUE-TRACKER DEVOPS GUIDE	2
1. GUIDING PRINCIPLES	2
1.1. It should just work	2
1.1.1. Personal responsibility	2
1.1.2. Attempt for 100% test coverage to achieve reliability	2
1.2. Naming conventions principle	2
1.3. Be user-friendly especially to developers and devops	2
2. INSTALLATIONS AND CONFIGURATIONS	2
2.1. Configure the Ubuntu repositories	2
2.2. Add the media keys	2
2.3. Install the postgre package with apt	2
2.4. Change the postgre user password	3
2.4.1. start the postgresQL	3
2.4.2. Start the psql client as the postgres shell user	3
2.4.3. Create the pgsq user	3
2.4.4. add the uuid generation capability enabling extension	3
2.4.5. Install the dblink extension as follows	4
2.5. Install the perl modules ( optional)	4
3. MAINTENANCE AND OPERATIONS	4
3.1. RDBMS Runstate management	4
3.1.1. To check the status of the postgresql	4
3.1.2. To stop the postgresql	4
3.1.3. To start the postgresql	4
3.1.4. to check the port on which it is listening	4
3.1.5. Check the postgres status	4
3.2. Application Layer runstate management	5
3.2.1. start the application layer	5
3.2.2. stop the application layer	5
4. USAGE SCENARIOS	5
4.1. Shell based actions usage	5
4.1.1. Run increase-date action	5
4.1.2. Run xls-to-db action	5
4.1.3. Run db-to-txt action	5
4.1.4. Load xls issues to db and from db to txt files	5
4.1.5. Run the issue-tracker file to db load	5
4.1.6. Verify the inserted data from the db	6
4.2. web based routes usage	6
4.2.1. Run the http://<<web-host>>:<<web-port>>/<<proj-db>>/get/<<table>>/<<guid>> route	6
5. BUSINESS LOGIC	6
5.1. Projects management	6
5.2. Increase the date for all projects	6
5.3. Categories	6
5.3.1. Issues / Issue items / items	6
5.3.2. to search for the project daily file	7
6. NAMING CONVENTIONS	7
6.1. Dirs naming conventions	7
6.2. Root Dirs naming conventions	7
7. APPLICATION CONTROL FLOW	7
7.1. Shell control flow	7
8. SOURCE CODE MANAGEMENT	8
8.1. Aim for tracability between userstories, requirements, features and functionalities	8
8.2. Feature development in a feature branch	8
8.3. ALWAYS Start with Unit Test	8
8.4. Branch for development - dev	9
8.5. Testing and integrations in the tst branch	9
8.6. Quality assurance in the qas branch	9
8.7. Production in the prd branch	9
9. SCENARIOS	9
9.1. A small team project hours tracking scenario	9
10. WAY OF WORKING	9
10.1. Definition of Done	9
10.2. E-mail communication	9
10.3. Chat / IRC	9
10.4. Documentation	9

# ISSUE-TRACKER DEVOPS GUIDE

## 1. GUIDING PRINCIPLES

This section might seem too philosophical for a start, yet all the development in the issue-tracker has ATTEMPTED to follow the principles described below. If you skip this section now you might later on wonder many times why something works and it is implemented as it is ... and not "the right way".

Of course you are free to not follow these principles, the less you follow them the smaller the possibility to pull features from your instance(s) - you could even use the existing functionality to create a totally different fork with different name and start developing your own tool with name X - the authors give you the means to do that with this tool ... , but if you want to use and contribute to THIS tool than you better help defined those leading principles and follow them.

### 1.1. It should just work

Any instance of the issue-tracker should simply work as promised. No less no more.

Any instance is the combination of code, configurations, binaries in the System and data - that is the instance you are using should just work for the set of functionalities promised.

#### 1.1.1. Personal responsibility

Any given instance of the issue-tracker should have ONE and only ONE person which is responsible at the end for the functioning of THIS instance - so think carefully before attempting to take ownership for an instance. The author(s) of the code are not responsible for the operation, bugs or whatever happens to a new instance. As a responsible owner of an instance you could create, share and assign issues to the authors of the source code, yet there is no service level agreement, nor even promise to help.

#### 1.1.2. Attempt for 100% test coverage to achieve reliability

The more you increase your test coverage the greater the confidence that the code will work as expected.

Do not write a single function without first implementing the testing call for that function - this has been proven really, really difficult, yet the more features are added the less the time wasted in troubleshooting of bugs and un-expected behaviour when proper testing is implemented.

Testing ensures the consistency and future expandability of the functionalities.

### 1.2. Naming conventions principle

All the names used in the code and the configurations MUST BE human readable and expandable - that is name the objects from the greater realm to the smaller - for example <<env>>\_<<db\_name>> , because the concept of operational IT environments ( dev , tst , qas , prd ) is broader than the concept of a application databases ...

### 1.3. Be user-friendly especially to developers and devops

You cannot achieve user-friendliness for the end-users unless your developers and technical personnel are happy while interacting with your artifacts.

## 2. INSTALLATIONS AND CONFIGURATIONS

### 2.1. Configure the Ubuntu repositories

Configure the Ubuntu repositories

```
sudo add-apt-repository "deb http://apt.postgresql.org/pub/repos/apt/ xenial-pgdg main"

sudo apt-get update
sudo apt-get install postgresql-9.6
```

### 2.2. Add the media keys

Add the media keys as follows:

```
wget --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
```

### 2.3. Install the postgre package with apt

Install the postgre package with apt

```
# update your repos
sudo apt-get update
```

```
# install the postgresql binary
sudo apt-get install postgresql postgresql-contrib

# enable postgre
sudo update-rc.d postgresql enable
```

## 2.4. Change the postgres user password

Configure the Ubuntu repositories

```
sudo passwd postgres
# Type a pw - add to your password manager !!!

# and verify
su - postgres
```

### 2.4.1. start the postgresSQL

Start the postgresSQL by issuing the following command

```
sudo /etc/init.d/postgresql start
```

### 2.4.2. Start the psql client as the postgres shell user

Start the psql client as the postgres shell user

source:

<http://dba.stackexchange.com/a/54253/1245>

```
sudo su - postgres
# start the psql client
psql

# the psql prompt should appear as
# postgres=#

# list the databases
\l
#and quit
\q
```

### 2.4.3. Create the pgsq user

Create the pgsq user and grant him the privileges to create dbs and to connect to the postgres db.

You could alternatively configure different way of authentication according to the options provided in this [stackoverflow](http://stackoverflow.com/a/9736231/65706) answer:

<http://stackoverflow.com/a/9736231/65706>

```
# create the pgsq user to be the same as the shell
# user you are going to execute the scripts with
sudo su - postgres -c "psql -c 'CREATE USER '$USER' ;'"

# grant him the privileges
sudo su - postgres -c "psql -c 'grant all privileges on database postgres to '$USER' ;'"

# grant him the privilege to create db's
sudo su - postgres -c "psql -c 'ALTER USER '$USER' CREATEDB;'"

sudo su - postgres -c "psql -c 'select * from information_schema.role_table_grants
where grantee='\"'$USER'\"';'"
```

### 2.4.4. add the uuid generation capability enabling extension

add the uuid generation capability enabling extension

```
sudo su - postgres -c "psql template1 -c 'CREATE EXTENSION IF NOT EXISTS \"uuid-osspl\";'"

sudo su - postgres -c "psql template1 -c 'CREATE EXTENSION IF NOT EXISTS \"pgcrypto\";'"
```

#### 2.4.5. Install the dblink extension as follows

Install the dblink extension as follows

```
sudo su - postgres -c "psql template1 -c 'CREATE EXTENSION IF NOT EXISTS \"dblink\";'"
```

### 2.5. Install the perl modules ( optional)

Install the perl module by first installing the server development package

```
# check which server development packages are available
sudo apt-cache search postgres | grep -i server-dev | sort

# install it
sudo apt-get install -y postgresql-server-dev-9.6

# install the DBD::Pg module
sudo perl -MCPAN -e 'install DBD::Pg'

sudo perl -MCPAN -e 'Tie::Hash::DBD'
```

## 3. MAINTENANCE AND OPERATIONS

### 3.1. RDBMS Runstate management

#### 3.1.1. To check the status of the postgresql

To check the status of the postgresql issue:

```
sudo /etc/init.d/postgresql status
```

#### 3.1.2. To stop the postgresql

To stop the postgresql issues:

```
sudo /etc/init.d/postgresql stop
```

#### 3.1.3. To start the postgresql

To start the postgresql issues:

```
sudo /etc/init.d/postgresql start
```

#### 3.1.4. to check the port on which it is listening

To check the port on which it is listening issue:

```
sudo netstat -tulnt | grep -i postgres
# tcp      0      0 127.0.0.1:5432 0.0.0.0:*        LISTEN    8095/postgres
```

#### 3.1.5. Check the postgres status

Check the postgres status.

Check the port to which the postres is running with this command:

```
sudo /etc/init.d/postgresql status

# restart if needed
sudo /etc/init.d/postgresql restart

# check on which ports it is running
```

```
sudo netstat -plunt |grep postgres
```

## 3.2. Application Layer runstate management

### 3.2.1. start the application layer

To start the application layer in development mode use the morbo command ( debug output will be shown ) , to start it in production mode use the hypnotoad pattern

```
bash src/bash/issue-tracker/issue-tracker.sh -a mojo-hypnotoad-start  
  
bash src/bash/issue-tracker/issue-tracker.sh -a mojo-morbo-start
```

### 3.2.2. stop the application layer

To stop the application layer in development mode use the morbo command ( debug output will be shown ) , to start it in production mode use the hypnotoad pattern

```
bash src/bash/issue-tracker/issue-tracker.sh -a mojo-hypnotoad-stop  
  
bash src/bash/issue-tracker/issue-tracker.sh -a mojo-morbo-stop
```

## 4. USAGE SCENARIOS

### 4.1. Shell based actions usage

#### 4.1.1. Run increase-date action

You track the issues of your projects by storing them into xls files in "daily" proj\_txt dirs.  
Each time the day changes by running the increase-date action you will be able to clone the data of the previous date and start working on the current date.

```
bash src/bash/issue-tracker/issue-tracker.sh -a increase-date
```

#### 4.1.2. Run xls-to-db action

You insert the date of the daily , weekly , monthly or yearly issues from the daily input excel file(s) by running the xls-to-db action.

If you have the guid column with uuid's than this will be upsert and not bare insert.

You should be able to update only non-nullable column by reducing the number of columns in your xls sheet.

```
export do_truncate_tables=1 ;  
bash src/bash/issue-tracker/issue-tracker.sh -a xls-to-db
```

#### 4.1.3. Run db-to-txt action

#### 4.1.4. Load xls issues to db and from db to txt files

to load xls issues to db and from db to txt files

```
bash src/bash/issue-tracker/issue-tracker.sh -a xls-to-db -a db-to-txt  
  
# or run for all the periods  
for period in `echo daily weekly monthly yearly`; do export period=$period ;  
bash src/bash/issue-tracker/issue-tracker.sh -a xls-to-db -a db-to-txt ; done ;
```

#### 4.1.5. Run the issue-tracker file to db load

Run the issue-tracker file to db load

```
# ensure the following actions will be tested  
cat src/bash/issue-tracker/tests/run-issue-tracker-tests.lst | grep -v '#'  
# output should be if not correct  
check-perl-syntax  
run-issue-tracker  
  
# test those uncommented actions
```

```
bash src/bash/issue-tracker/test-issue-tracker.sh
```

#### 4.1.6. Verify the inserted data from the db

Verify the inserted data from the db as follows:

```
# check that the rows were inserted
echo 'SELECT * FROM issue ; ' | psql -d dev_issue_tracker
```

### 4.2. web based routes usage

#### 4.2.1. Run the `http://<<web-host>>:<<web-port>>/<<proj-db>>/get/<<table>>/<<guid>>` route

Load a table with guid's.

Check a single item with your browser, for example:

`http://doc-pub-host:3000/dev_stockit_issues/get/company_eps/727cf807-c9f1-446b-a7fc-65f9dc53ed2d`

```
# load the items
while read -r f; do
  export xls_file=$f;
  bash src/bash/issue-tracker/issue-tracker.sh -a xls-to-db ;
done < <(find $proj_txt_dir -type f)

# verify the data
psql -d $db_name -c "SELECT * FROM company_eps "
```

## 5. BUSINESS LOGIC

### 5.1. Projects management

You can manage multiple projects with the issue-tracker tool. Each project has its own data directories, database storage and configurations. You could also have different environments named dev,tst,prd for each project separately.

As the tool is backwards compatible you could have different instances of the issue-tracker projects with different versions ( and set of features ) operating against different project ( each one in its own version).

You must pre-set the configuration variables of an issue-tracker project each time you start working on a project from the shell

```
doParseIniEnvVars /vagrant/csitea/cnf/projects/isg-pub/isg-pub.issue-tracker.doc-pub-host.conf
```

### 5.2. Increase the date for all projects

to increase the date for all the projects at once use the following oneliner.

```
while read -r f ; do doParseIniEnvVars $f ; bash src/bash/issue-tracker/issue-tracker.sh -a increase-date ; done < <(find doParseIniEnvVars
/vagrant/csitea/cnf/projects/issue-tracker/ -type f)
```

### 5.3. Categories

Each issue item could be categorized under one and only one category. One category might have 1 or more issues.

The categories could contain letters ,numbers, dashes

```
Examples:
organisation-it
organisation-it-operations
```

#### 5.3.1. Issues / Issue items / items

Issue item is the shortest possible description of task , activity , note or anything requiring distinguishable and preferable measurable action or producing verifiable outcome.

Issues could be of different types - tasks, activities, notes etc.

```
Examples:
go get the milk
do the homework
procurement e-mail discussion follow-up
```

### 5.3.2. to search for the project daily file

to search for the project daily file run the following liner first to start the dev server of the react mini-app.  
Than point your broser at the following url:  
`http://doc-pub-host:3307/`  
( Hardcoded for now ... )

```
bash src/bash/issue-tracker/issue-tracker.sh -a mojo-morbo-start
```

## 6. NAMING CONVENTIONS

### 6.1. Dirs naming conventions

The dir structure should be logical and a person navigating to a dir should almost understand what is to be find in thre by its name ..

### 6.2. Root Dirs naming conventions

The root dirs and named as follows:  
bin - contains the produced binaries for th project  
cnf - for the configuration  
dat - for the data of the app  
lib - for any external libraries used  
src - for the source code of the actual projects and subprojects

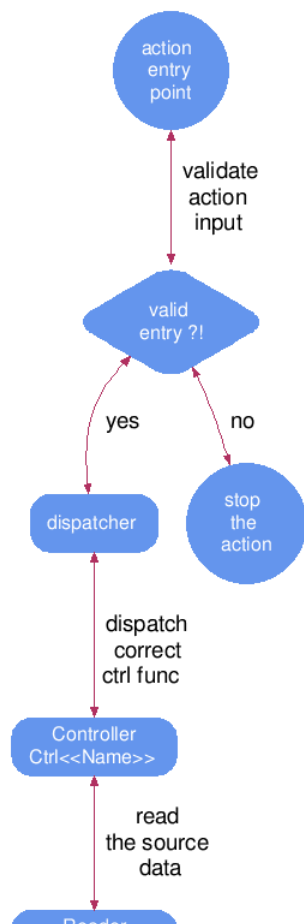
## 7. APPLICATION CONTROL FLOW

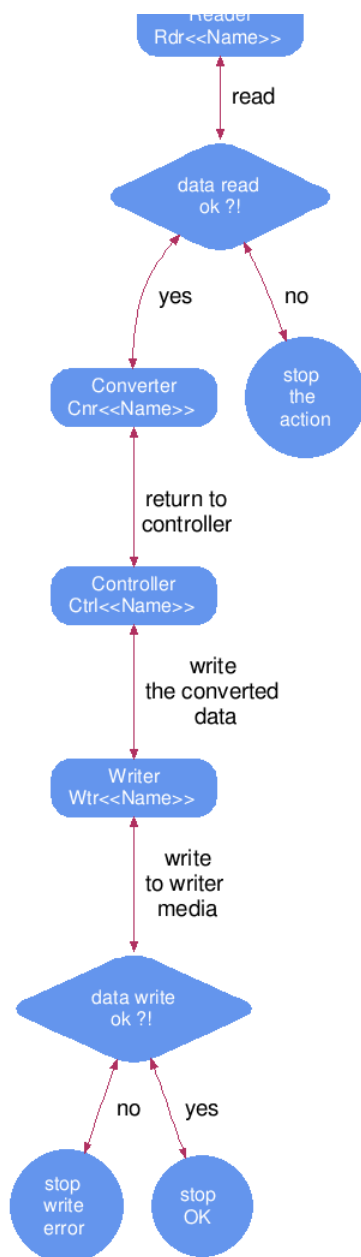
This section provides a generic control flow description for the shell based and ui based control flows.

### 7.1. Shell control flow

The shell control flow is based on the control model input output architecture.

Figure: 1 issue tracker control flow





control flow in shell actions' execution

## 8. SOURCE CODE MANAGEMENT

The issue-tracker is a derivative of the wrapp tool - this means that development and deployment process must be integrated into a single pipeline.

### 8.1. Aim for tracability between userstories, requirements, features and functionalities

Once the issues are defined and you start working on your own branch which is named by the issue-id aim to map one on one each test in your code with each listed requirement in confluence and / or JIRA.

### 8.2. Feature development in a feature branch

You start the development in your own feature branch named : dev--<<issue-id>>--<<short-and-descriptive-name>>.

### 8.3. ALWAYS Start with Unit Test

Do not ever never write code without starting first the unit test on how-to test the code. Period. This is the only way to avoid braking old functionalities when the application code base grows larger.

Each time a new bug is found fix it by adding new UnitTest!



#### **8.4. Branch for development - dev**

No code should be merged into the development branch without broad testing coverage and approval from the owner of the instance - as the owner of the instance is at the end responsible personally for the whole instance.

#### **8.5. Testing and integrations in the tst branch**

The tst branch is dedicated for testing of all the tests, the deployment, performance testing and configuration changes. Should you need to perform bigger than a small hotfix changes you must branch the tst branch into a separate dev--feature branch and re-run the integration testing and approval all over.

#### **8.6. Quality assurance in the qas branch**

At this phase all the tests with all the expected functionalities should work at once. No small hotfixes are allowed - if a need arises new branch is created to the tst branch The quality assurance

#### **8.7. Production in the prd branch**

The prd branch is the one deployed to the production environment. This code is NOT straight merged into the master branch , but after certain time depending on the dynamic of the tool with bugless operation merged.

### **9. SCENARIOS**

#### **9.1. A small team project hours tracking scenario**

This scenario describes the steps and processes, which could be implemented to achieve a small team ( 3-10 ) members issue-tracking with hours reporting by using the issue-handler combined with Google Cloud authentication and storage.

### **10. WAY OF WORKING**

This section describes the way of working within a team working on the issue-tracker project.  
The work on the issue-tracker project is conducted by using the Scrum methodology, thus the Scrum

#### **10.1. Definition of Done**

Each issue must have a tangible artifact. An issue without tangible artifact is a thought thrown in the air.  
The DoD must be iterated and updated during each Sprint Review.

#### **10.2. E-mail communication**

Do not use e-mail communication for code style, testing, developing etc. Issues which could be achieved with the code review interface of the source code management system.  
Before writing an e-mail think first could you find a way to avoid writing it at all.  
Do not expect answer of your e-mail within 2 hours.  
Use e-mail when you have to get a written evidence on agreed matters, which might cause later on discussions.

#### **10.3. Chat / IRC**

Should you want a quicker response than 2 hours use the chat tool

#### **10.4. Documentation**

Undocumented feature is not a feature.