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# BC-SIM-TN-007
# simClean
# User Manual

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# 1. Introduction

## 1.1. Scope

This document describes the use of the software developed to solve the issues founded on the EDDS system to retrieve the SIMBIO-SYS raw data used as input for the data reduction pipeline [RD2]. In the cited TC was discussed that a packet could be received by two, or more, different ground stations. At ESOC level the packets result different. They have different SCOS header but the same data. Those packets introduce a duplication of one or more subframes compromising the scientific data.

## 1.2. Applicable documents

There are no applicable documents.

## 1.3. Reference Documents

**[RD1]** BC-SIM-TN-003 - Reports and Notes Layout and Flow (DOI: http://dx.doi.org/10.20371/INAF/TechRep/36)
**[RD2]** BC-SIM-TR-016 - EDDS Issue -Science Packets replicated (DOI: http://dx.doi.org/10.20371/INAF/TechRep/101)
**[RD3]** SCOSpy Version 0.2.1 - User Manual (DOI: http://dx.doi.org/10.20371/INAF/TechRep/38)

## 1.4. Acronyms

| | |
|---|---|
| **APID** | Application ID. |
| **EDDS** | EGOS Data Disposition System. |
| **EGOS** | ESA Ground Operation System. Infrastructure SCOS-2000. |
| **ESOC** | European Space Operations Centre. |
| **ESA** | European Space Agency. |
| **GFTS** | Generic File Transfer System. |
| **SIMBIO-SYS** | Spectrometers and Imagers for MPO BepiColombo Integrated Observatory SYStem. |
| **SSC** | Source Sequence Counter. |
| **STC** | STereo imaging Channel. |
| **TC** | Telecommand. |
| **UTC** | Universal Time Coordinated. |
| **VIHI** | VIsible and Hyper-spectral Imaging channel. |
| **XML** | eXtensible Markup Language. |

## 1.5. Document Format and Repository

This document is compliant with the SIMBIO-SYS Report and Note Layout and Flow [RD1]. It will be archived both on the INAF Open Access repository and the SIMBIO-SYS team Archive.

# 2. Software Description

The simClean is a module developed to remove from an XML file, used as input for the SIMBIO-SYS pipeline, the possible duplicated science, or diagnostic packets, see [RD2].
The module is developed in Python 2.7 for the SIMBIO-SYS pipeline environment, CentOS 7. Some tests demonstrated that it also works correctly in other LINUX distributions (Ubuntu and Fedora) and macOS (10.15.6 and earlier).
The software analyzes the SCOS 2000 header of the telemetry file, Using the python library SCOSpy [RD3], and groups the packets by APID, and checks the presence of other packets with the same APID, SSC and Filing Time but with different progressive index (XMLID). If the software found an occurrence it means the packets is duplicated and so it discards it.

## 2.1.Version

The current version of the software is 0.4.0 and is included in the SIMBIO-SYS pipeline SimGen starting from version 1.2.0

## 2.2.Usage

The standard usage of the software is

```
$./simClean tml.xml
```

where tml.xml is the TLM file written in XML format.
The software can be used with some optional arguments:

-h, --help
-d, --debug
-l fileLog, --logFile fileLog
-o out, --output out
-s, --summarize
-v, --version

Those are described in the following subsections.

### 2.2.1. Help

Print a help message indicating the options and exit.
In this case the file name is ignored.

```
$./ SimGen/bin/simClean  -h
usage: simClean [-h] [-d] [-l fileLog] [-o out] [-s] [-v] file
```

```
SIMBIO-SYS Telemetry Filter

positional arguments:
  file                  XML file to process

optional arguments:
  -h, --help            show this help message and exit
  -d, --debug           Enable the debug
  -l fileLog, --logFile fileLog
                        Name and location of the Log file
  -o out, --output out  Output file
  -s, --summarize       Show packets information by APID
  -v, --version         show program's version number and exit
```

### 2.2.2. Debug

This option enables the debug mode, and the verbosity of the software is incremented.

### 2.2.3. LogFile

It is used to define the name of the log file. If not provided is used the pipeline log default file (*simGen-logfile.log*).

### 2.2.4. Output

Set the file name and path for the software output (*out*). If not provided, the output filename is the same as the input file with the suffix *_cl*.

### 2.2.5. Summarize

At the end of the elaboration, the software prints a table with the count of packets for each APID. For each APID is reported:

- APID number
- Description
- Packets found in the input file
- Packets are written in the output file
- Temporary file for the packets storage.

An Example of the output with the summarize option is reported below:

```
======================
APID:           801
Name:           Telecommand
```

```
Total Packets:  102
Saved Packets:  51
Output File:    Telecommand.csv
=======================
APID:           804
Name:           Housekeeping
Total Packets:  52
Saved Packets:  26
Output File:    Housekeeping.csv
=======================
APID:           807
Name:           Event_Report
Total Packets:  50
Saved Packets:  25
Output File:    Event_Report.csv
=======================
APID:           809
Name:           Memory_Management
No data found
=======================
APID:           828
Name:           HRIC_Low_Priority
No data found
=======================
APID:           876
Name:           HRIC_High_Priority
No data found
=======================
APID:           844
Name:           STC_Low_Priority
Total Packets:  4381
Saved Packets:  4381
Output File:    STC_Low_Priority.csv
=======================
APID:           892
Name:           STC_High_Priority
No data found
=======================
APID:           860
Name:           VIHI_Low_Priority
No data found
=======================
APID:           908
Name:           VIHI_High_Priority
No data found
```

### 2.2.6. Version

Print the software version number and then exit.
In this case, the file name is ignored.

## 3. Output

The output file is an XML file in the same format as the input one but without duplicated packets. The default output filename is characterized by the suffix *_cl*.
Some temporary files are generated and stored in the same folder as the output file. They contain the main information coming from the SCOS header:

- Filing Time
- SSC
- XMLID

## 4. Versions History

0.4.0 add logfile option for the integration in the simGen pipeline
0.3.0 Add all the options to be compliant with the other simGen modules
0.2.0 Remove the duplicated HK packets.
0.1.0 Original Version. Remove the duplicated science packets.