Read the GTS bulletin keys as well as GRIB/BUFR messages - ecCodes BUFR and GRIB FAQ

Step-by-step guide

You have an input file containing GRIB or BUFR messages but each one of the messages also has a GTS wrapper. You want to print the GTS keys as well as the GRIB/BUFR keys for all these messages.

Each block looks something like this (repeated for each message):

GTS header				Enclosed GRIB/BUFR message	GTS footer			
SOH	CR	CR	LF	010100100100111.....	CR	CR	LF	ETX

The example below shows a Python script which has two loops: The first one over the GTS messages and the second loop over the GRIB messages. In the first pass we store the GTS key values into a dictionary for later access (a dictionary whose key is the message number and whose value is another dictionary storing the GTS keys and their values)
When we come to the GRIB messages we access the dictionary to get the relevant GTS keys.

To read BUFR messages instead, simply change the call from "codes_grib_new_from_file" to "codes_bufr_new_from_file".

```python
from eccodes import *

INPUT = sys.argv[1]
mydict = {}

# GTS loop
cnt = 0
with open(INPUT, 'rb') as fin:
    while 1:
        gts = codes_gts_new_from_file(fin)
        if gts is None:
            break
        # Get the relevant keys from the GTS bulletin
        cnt += 1
        tt = codes_get(gts, 'TT')
        aa = codes_get(gts, 'AA')
        ii = codes_get(gts, 'II')
        mydict[cnt] = {'TT': tt, 'AA': aa, 'II': ii}
        codes_release(gts)

# BUFR/GRIB loop
cnt = 0
with open(INPUT, 'rb') as fin:
    while 1:
        msgid = codes_grib_new_from_file(fin)
        if msgid is None:
            break
        cnt += 1
        sn = codes_get(msgid, 'shortName')
        idict = mydict[cnt] # Access GTS values
        tt = idict['TT']
        aa = idict['AA']
        ii = idict['II']
        print(tt, aa, ii, sn)
        codes_release(msgid)
```

Note: Sometimes a GTS envelope may include multiple GRIB/BUFR messages. The example above assumes that for each GTS wrapper there is exactly one GRIB/BUFR message.

Related articles

- Keys and their types - ecCodes GRIB FAQ
- How to install ecCodes with Python bindings in conda - ecCodes FAQ