WG on system aspects
held besides the 26th Aladin/Hirlam Workshop, Lisbon, 06/04/2016
Notes
(by M. Derkova, SHMU)

Agenda:
1) Compilers
2) Scalability
3) OOPS
4) Cycles
5) Tools
6) DA configs including obs handling in mitraillette
7) AOB

1) Compilers
- It was noted that one has to be sure using the right version of the compiler and the compiler's options. As an example: the cray compiler is very efficient but unstable; gfortran was tested for version 4.9 but 5.3 is already available; intel compiler v15 is recommended despite v16 being available. It is not sure compilations will work straightforward for CY43.
- Problems with compilation of SURFEX v8 might occur as well => contact alabobo.
- Future issues might arise from the novelties coming with OOPS (C++, Python). A recent example from the workshop is the MFLA library of C++ classes developed by Roel Stappers, which makes an extensive use of autopointers which are a C++ Version 11 supported feature, but not yet really implemented properly in the known compilers (eg. Cray).(Roel's presentation).
- It is recommended to update the list of minimum/supported computer languages (C, Fortran, C++, Python) features needed by NWP community incl ECMWF, that should be given to HPC vendors.
- HIRLAM maintains wiki page on recommended compiler options (https://hirlam.org/trac/wiki/HarmonieSystemDocumentation#Installation)

2) Scalability
- It was mentioned that E. O'Brien is not working anymore at ICHEC, nevertheless new manpower shall be expected to work on scalability.
- It was recognised that there is a group at the University of Barcelona (Barcelona Supercomputing Center, BSC) working on the AROME code scalability via a project. A presentation of their work would be welcome by the HIRLAM-ALADIN group.
- It was noted that some parts of the code (e.g. gridpoint physics, SURFEX) are not very well vectorised and some work is expected on this issue either in frame of dedicated projects (e.g. ESCAPE) or by HPC vendors.

3) OOPS
- Several technical questions were raised mostly on the levels of compilers, e.g. whether it is possible to compile C++ layer with C gnu compiler and the rest of the code with more efficient Fortran compiler? It is believed that in principle it should be possible, one has to be careful not to mix modules, only objects.
- It was pointed out that there were several interesting presentations given at ECMWF concerning future technical evolution of the code (especially the slides by Peter Lean about ODB and by

Alan Geer about the new GOM dataflow; files can be asked from Claude and will be put on the Aladin LTM technical website)

4) **Cycles**
   - The question on possible change of ALADIN consortium usual strategy in porting new code version (i.e. waiting for official export version) was raised. No discussions were opened within Aladin consortium on this topic recently.
   - Meteo-France did not make any decision what would be the next _export cycle. The last declared export version is based on CY40T1 and is still being implemented in a number of Aladin countries in 2016. It was noted that this version was not an operational version at MF, but specific validation of Arome with data assimilation was carried out. The decision about the next export version remains open and shall be addressed between MF and the PM. It was recognized that the ALADIN assimilation configurations are critical for validation of export version.
   - A possible candidate for the next export could be CY43T1, as several cycles exports were skipped due to heavy technical code changes (oopsification, refactoring…). However, the expectations have to be clearly defined as well: what are the parts of new cycle that will provide a substantial upgrade for Partners operational suites and what would be the time schedule Partners plan to run it?
   - An ACNA webex shall be scheduled with participation of HIRLAM System PL to discuss this issue.

5) **Tools**
   - The EPyGram tool presented by A. Mary has been discussed. It was noticed that it can be used as an FA files convertor. For the time being it is about twice slower than progrid software but can be parallelized. The possibility to use EPyGram for femars programs was mentioned as well.

6) **DA configs including obs handling in mitraillette**
   - The need of a simple example of an ODB file corresponding to a new cycle was stressed, as this would allow to start the validation of the assimilation configurations. It is needed for checking the BATOR->ODB conversion and the ODB basic structure. A simple example with conventional observations for a small domain would be OK for the very start. Action on Claude to check whether a simple ODB file can be produced in the course of the early validation of CY43.

7) **AOB**
   - The introduction of the AROME/HARMONIE configuration in mitraillette is still pending.
   - OOPS test programs: the HOP driver has been preliminarily tested by Eoin, no further information for the time being.