OOPS technical meeting of March 6th 2012
IFS cleaning and re-factoring : Part 2

Participants (MF) : Claude Fischer, Karim Yessad, Yves Bouteloup,
                         Ludovic Auger, Stéphane Martinez
Participants (EC) : Deborah Salmond, Yannick Trémolet, Tomas Wilhelmsson,
                         Sylvie Malardel
Participants(HIRLAM) : Ulf Andrae

1. Introduction

This meeting is a continuation of the discussions on February 29th 2012 and is the first 3-way video-conference with EC, MF and HIRLAM

2. GIT

MF are preparing to move to Git from Clearcase by March 2013 and Stéphane had circulated an initial document with his ideas on the implementation of Git at MF to EC and Ulf. This had started the discussions and some emails had already been exchanged.

Tomas is actively considering the possibility of EC moving from Perforce to Git and had been thinking about how certain aspects in the decisions of how to use Git would mean that MF and EC could take advantage of the fact that both would be using the same source code management system. Tomas thought that the main difficulty would arise if MF and EC had different sets of files in their repositories. This could be addressed either by MF and EC each having separate repositories for each project (eg. ifs, ifsaux etc.) or by having just 2 repositories: one for projects which are shared and one for projects which are separate.

Claude said that the exchange by tar-file was fairly safe and had worked successfully up to now. Tomas said the exchange by tar-files could still be OK with Git – but that in addition EC and MF would be able to see the history of the changes from each-other. Also it would be easier to share on-going developments and Git would not try to merge the same thing twice etc.

As with Clearcase/Perforce there would be special repositories at MF and EC which are a fixed-point for the common cycle and one person (Stéphane at MF and Deborah at EC) would 'pull' contributions from developers when notified that they were ready. This is different from the practice for HIRLAM where several developers can 'push' contributions to the main repository.

With Git there are tools to see other peoples branches (Git_hub) and to easily make FLUB-style record of what has been pulled into the main cycle.

HIRLAM currently use a mixture of Subversion and Git – but will be ready to change with MF and EC.

The discussion would continue by email with an update at the next coordination meeting.

The contact points are:
MF: Stéphane and Claude
EC: Tomas, Paul, Mike and Deborah
HIRLAM: Ulf

MF's timescale for implementation for Git was dependent on the timing of CY39T1 – but expected to be between the end of 2012 or March 2013 at the latest.

3. Cleaning of Dynamics

Karim has done much cleaning of the dynamics for CY38T1 and there have also been developments from EC in CY38R1.

i. LGRADSP
    Nils had introduced an anti-aliasing feature under a new switch : LGRADSP. Karim had some comments on how this had been implemented – in particular, a discussion took place on whether TRANS/TFL routines (EC coding), rather than SPEREE/REESPE (MF suggestion), should have been used to interface to the transforms. The outcome so far was that we should not take a "dogmatic" view on this, but choice between the two solutions must be let according to what is easier; in some cases SPEREE/REESPE or their LAM counterparts remain more convenient to use. Additional comments by Karim: variable LGRADSP must be in YOMDYNA rather than YOMDYNDIFF, other YOMDYNDIFF variables can remain in YOMDYNDIFF. This would be further discussed during Karim's visit to EC in May.

ii. SUHDF
    Because of the difficulty of maintaining a code that covered both EC and MF implementations of the horizontal diffusion EC and MF had agreed that this routine should be split into a modernised SUHDF – containing the MF modernisation of SUHDF and a second routine SUECHDF which contained the latest EC developments. The 2D shallow water version was now split off into a third routine SUHDF2. The new routines made the vertical and horizontal split clearer and it would now be more flexible and easier to adapt to LAM.

iii. GPHPRE
    Karim has introduced a new routine GPHPRE to replace GPPREH+GPXYB+GPPREF and GPPRE – i.e. 4 routines replaced by one routine with a defined interface and use of optional arguments. This replacement had been done in the dynamics and FULL-POS but still had to be done in many other places eg. HOP. It was thought that this work could be finished by CY40, as a share between MF and EC (which would update the calls under HOP, in particular).

iv. LASCAW
    George plans to do the work of removing modules/global variables from the Semi-Lagrangian interpolation subroutine tree for CY38R2 The interpolation could then be externalised as described in Karim's document on the subject. It was noted that this work would overlap with the cleaning of the Obs-interpolation described by Alan Geer at the previous meeting – for example Karim pointed out that SLINT_CANARI should berationalised and transformed into an externalizable routine renamed LASCAW_LSM. Also LRLOI from Ludovic needed similar attention. Also the Observation interpolation is more like the FULL-POS interpolation as there is no vertical interpolation. There would be time for further discussion on this topic during Karim's visit to EC in May.

4. CDCONF replacement

Karim had produced a comprehensive document describing the uses of the CDCONF string as it is now. It is felt that this would better be replaced by different flags for each action rather than one

(very overloaded) flag which does everything.Karim had considerably simplified the use of CDCONF(4:4) under CPG/TL/AD and the use of CDCONF(9:9) under (E)SPCM/AD, otherwise no work had started on this yet. It was decided that EC could do the 'easy cleaning' (and maybe 'beyond easy') items described in C.2 of Karim's document. CDCONF should certainly be removed from low-level routines. To replace all the uses of CDCONF would be a massive work – so a progressive approach would be taken and work would be done as necessary as the OOPS development progressed. It was thought that neither EC nor MF use NMI any more so these uses could be removed[1]. Deborah would double-check whether there was any remaining uses of NMI at EC.
ACTION   Deborah

5. <u>Removal of command line options</u>
The work to develop OOPS scripts had not yet started at ECMWF – however a vacancy notice for a short-term consultant to help with this work would soon be advertised. Karim had produced a document outlining the different uses of the command line options. In particular the LAM applications use the command line extensively. In the long-term the command line options would be removed - for now the use in IFS could remain – but OOPS would not use them.
MF would progressively prepare the removal from the Fortran code.

6. <u>CY40</u>
Following on from CY39 in Sept/Oct 2012 – it is foreseen that CY40 would be released in May/June 2013. This would fit in with the MF time-scale for porting to their new computer at the end of 2013.
The technical content of CY40 was expected to include:

- Work on SL interpolators (Karim)
- Obs-interpolation restructuring (Alan Geer / John)
- Further break-up of setup routines (Tomas+ LAM)
- Cleaning of CDCONF
- Command line (part of it)
- GFL/GMV cleaning (Sylvie + Karim for discussion and liaison)
- Enable more than one geometry (Tomas)
- Call only GPHPRE (EC + Karim)
- Optimisations in the lateral coupling (Karim / if time left to do that)

CY41 was foreseen to be released Spring/early Summer of 2014.
CY42 was the target for OOPS to replace IFS in operations at EC.

7. <u>OOPS Developments</u>
Yannick had made some changes to the C++ layer of OOPS to replace the polymorphic inheritance by templates. This had been one of the out-comes of the technical-review. Now all dynamic casts, friends and most factories had been removed. Yannick would be able to give MF a new version of OOPS C++ by next week.   ACTION
Tomas will attend the HIRLAM meeting on 13/14 March to discuss OOPS/LAM work. MF would join this meeting by video-conf and Piet Termonia would attend from Aladin.
Yannick was now working on putting the JC/DFI in the C++ layer. The EPS and Singular vector applications were expected to be in OOPS by the end of 2013. This work would be done by Martin

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1   Additional post-meeting info by Karim: pruning NMI would suppress about 60 routines, plus some localized code in Setup/ALLOC/DEALLOC. Karim already has listed these elements and is ready to dispatch the info.

Leutbecher.

The Scientific Review of OOPS is scheduled to start before the end of March – with the release of the 3D-Var demonstrator and accompanying documentation.

 AOB
- ESIG – Yannick would respond to Claude's email proposing how ESIG might be removed from the JB structure.
ACTION   Yannick

- Karim's Visit to EC was now scheduled for Week 21 i.e. 21-25 May.

Next meetings:

Next coordination video-conference: March 29, 2012

[OOPS Steering Committee (for information): May 3 in Toulouse]

Next physical coordination meeting: June 28, 2012, in Toulouse

List of Actions:

1. Deborah would check with Mats whether there was any remaining uses of NMI at EC.
2. Yannick would be able to give MF a new version of OOPS C++ by next week.
3. Yannick would respond to Claude's email proposing how ESIG might be removed from the JB structure.