Time-critical applications

Dominique Lucas
User Support

Member State time-critical applications

- Following Council support in 2005, a framework for Member State time-critical applications has been implemented.

- It consists of 3 options:

  1) Simple job submission monitored by ECMWF

  2) Member State 'ecFlow' suites monitored by ECMWF

  3) Member State 'ecFlow' suites managed by ECMWF

- Technical guidelines to advise on the development of such suites are available from the web:

  https://software.ecmwf.int/wiki/display/UDOC/Time+Critical+applications

MS time-critical applications: Introduction

- ## Daily data access from real-time archive in Feb 2015 (March 2013):
  - ECMWF data distribution – dissemination to 'Member States':
    - RMDCN: 90GB (110GB)
    - Internet: 1100GB (500GB)
    - Local dissemination: 1500GB (*2) (750GB)
  - Real-time MARS access by MS users on ecgate:
    - 1000GB (600GB)

MS time-critical applications: Option 1

- ## Enhanced ECaccess batch system
  - Scheduled run of jobs and retry mechanism (in ectrans) were already available in ECaccess.
- ## New concept of events, also known as notifications, added to ECaccess
  - Events are defined by one user; they can be made publicly available.
    - Event name: "fc12h240"
    - Event description: "at this stage, the 10 day forecast data from the high resolution 12UTC run is available"
  - Users can subscribe their own jobs to "public events"; these jobs will remain in standby mode until …

MS time-critical applications: Option 1

- ## events - notifications

  - … until the event owner sends a notification to an event; ECaccess will then submit the jobs subscribing to that event.

  - Environmental variables can be passed to the jobs when the notification is given to the event, e.g. a date, time, …

  - Last but not least, soon after the notification of an event, ECaccess will schedule a new version of the jobs subscribing to the event, ready to be submitted at the next notification.

- ## More than 1300 jobs for about 170 users in ~60 events.

MS time-critical applications: Option 1

MS time-critical applications: Option 1

MS time-critical applications: Option 1

MS time-critical applications: Option 1

- list events available to user:

> ecaccess-event-list
```
326    ef00hplumes    At this stage, the EPS plume charts at 00UTC have been updated.
341    ef00h240       At this stage, the ensemble forecast model at 00UTC (step 240) is complete
342    ef12h240       At this stage, the ensemble forecast model at 12UTC - step 240 - is complete
343    bc00h072       At this stage, the boundary condition forecast at 00UTC - step 72 - is complete.
167    an00h000       At this stage, the analysis at 00UTC is complete.
168    an12h000       At this stage, the analysis at 12UTC is complete.
172    ef00hmetgram At this stage, the EPS metgram database at 00UTC has been updated.
...
```
> ecaccess-event-list 342
```
Notification id: 342
       Name: ef12h240
       Public: true
       Owner: emos
Comment: At this stage, the ensemble forecast model at 12UTC - step 240 - is complete.
```

MS time-critical applications: Option 1

- ## Submitting job and checking job status

> `ecaccess-job-submit -help`
Usage:
   ecaccess-job-submit -version|-help|-manual

   ecaccess-job-submit [-debug] [-local] [-encrypt] [-bufsize length]
   [-scheduledDate date] [-noDirectives] [-gateway name] [-remote location]
   [-transferOutput] [-transferError] [-transferInput] [-keep] [-eventIds
   list] [-sterr2Stdout] [-noRenew] [-mailTo email] [-onStart] [-onSuccess]
   [-onFailure] [-onRetry] [-jobName name] [-manPage content] [-lifeTime
   days] [-retryCount number] [-retryFrequency frequency] [-queueName name] source

> `ecaccess-job-submit –noDirectives –eventIds 342 –retryCount 2 –queueName ecgate sms.cmd`
35853
> `ecaccess-job-list 35853`
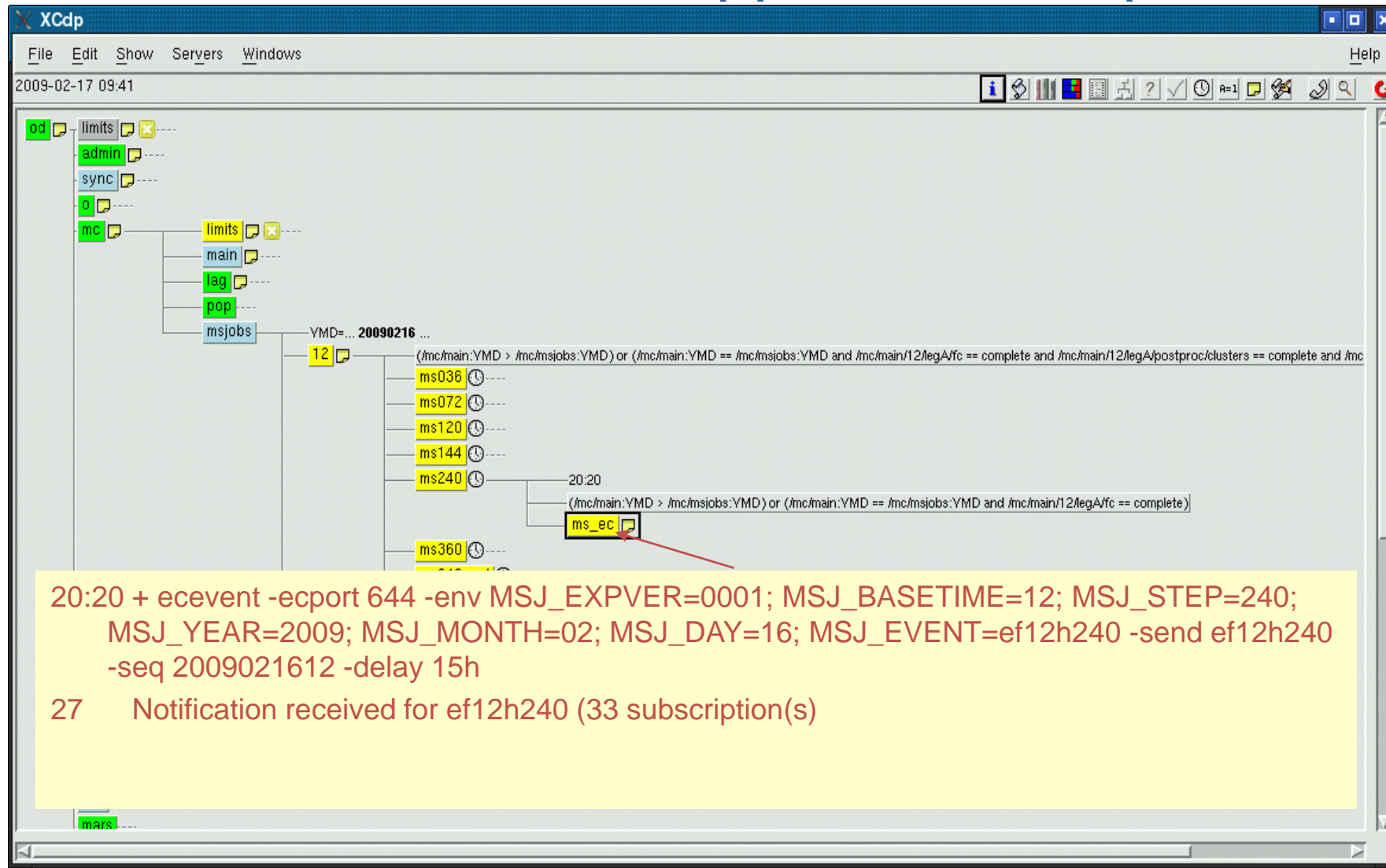**Jobid: 35853**
Location: ecgate@ecgate.ecmwf.int
Notification(s): ef12h240 (342)
Schedule: May 31 20:06
Try number: 0/2
Status: STDBY

MS time-critical applications: Option 1

Operators' interface – monitoring

Management of your own notifications

- Defining events and sending notifications to them:

```
>  ecevent -help
Usage: ecevent [-create|-send|-clear|-delete|-grant|-update] <MyNotification> \
       [-comment "comment_for_my_notification"] \
       [-public] [-private] [-env "variables_to_pass"] [-seq <number>] \
       [-notify|-subscribe] [-users "list_of_users"]


>  ecaccess-event-send –help
Usage:
    ecaccess-event-send -version|-help|-manual

    ecaccess-event-send [-debug] [-environment variables] [-delay duration]
    [-at date] event-id sequence
```

MS time-critical applications: Option 2

Member State ecFlow (or SMS) suites *monitored* by ECMWF

– Suitable for more complex applications with several tasks with interdependencies between them.

– ecFlow suites developed according to technical guidelines provided by ECMWF

– ECMWF operators will provide monitoring and restart services

– Use of this service needs to be requested by the TAC representative of the relevant Member State.

MS time-critical applications: Option 2

Enhanced access to ECMWF resources:

- Inspired from the environment used for ECMWF's Operational work.

- Special UIDs are used, e.g. zit, zde, zno …

- Access to high priority queues on ecgate and the HPCs.

- Access to duplicated storage systems on the HPCs.

- Possibility to get input data using ECMWF's operational data dissemination system (ECPDS).

- Possibility to use ECPDS to send output data.

MS time-critical applications: option 2

More activities to come, e.g. from Ireland, Serbia and others ...

MS time-critical applications: Option 3

Member State ecFlow (SMS) suites *managed* by ECMWF

- Further enhancement of the previous option
- Application developed, tested and maintained by the MS
- It must be possible to test the application using ECMWF e-suite data
- MS suite handed over to ECMWF
- MS responsible for the migration of the application
- ECMWF will monitor this suite
- ECMWF could provide first-level on-call support while second-level support would be provided by the MS
- To be requested by the TAC representative of the relevant Member State
- Option suitable when one or a small number of MS want to run a specific time-critical project

MS time-critical applications – option 3
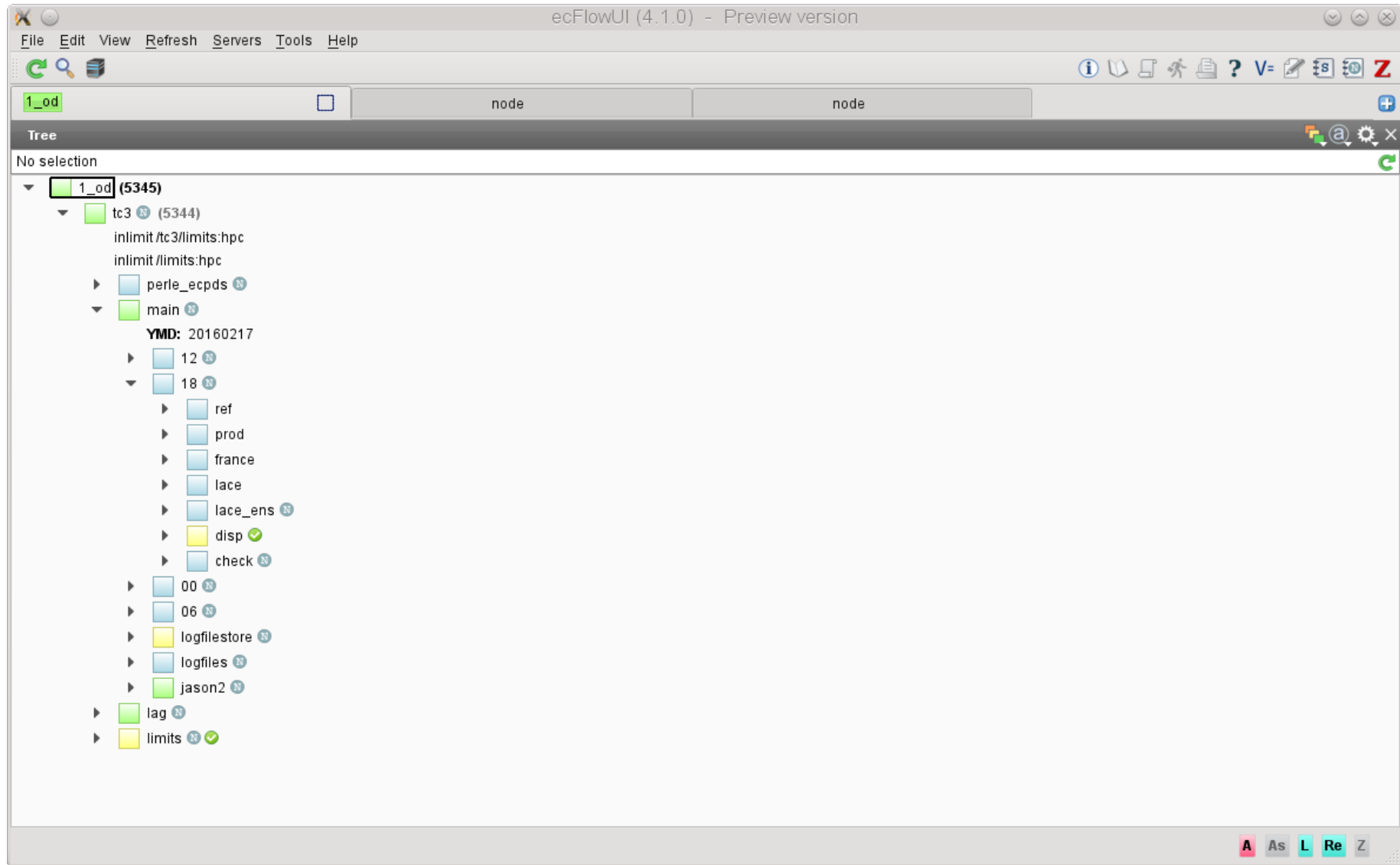
MS time-critical applications: Option 3

- ## LBC for LAMs:
  - 'Up to 60h', four times a day at 00/06/12/18 UTC for Meteo-France, several domains, hourly data.
  - Up to 108h, once a day at 12 UTC for Meteo-France (MOCAGE), 2 domains, hourly data.
  - Up to 78h, four times a day at 00/06/12/18 UTC for LACE countries (Hungary, Czech Rep, Slovenia, Croatia, Austria) as part of the BC Optional Programme, hourly data used.
  - Up to 60h, 4 times a day, ENS BC data being built for the LACE_ENS project run by the Hungarian Met. Service.

- ## PERLE for Meteo-France
  - "on demand" data extraction of IFS boundary conditions to be used to drive a dispersion model running in Toulouse.

Reference

- Time critical applications:

  https://software.ecmwf.int/wiki/display/UDOC/Time+Critical+applications

- ecFlow:

  https://software.ecmwf.int/wiki/display/ECFLOW/