Time-critical applications

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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)

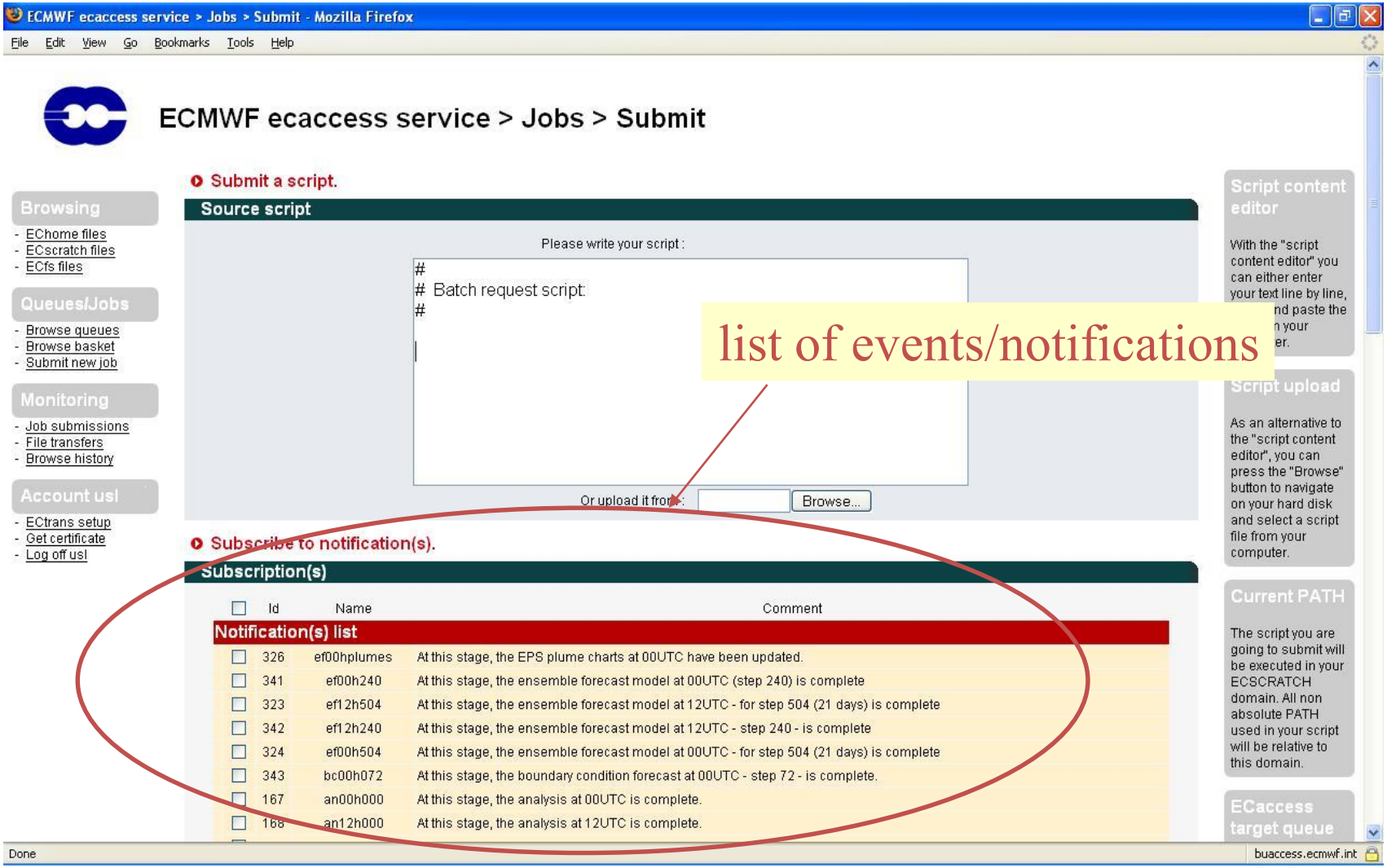
MS time-critical applications: Option 1

- 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 …

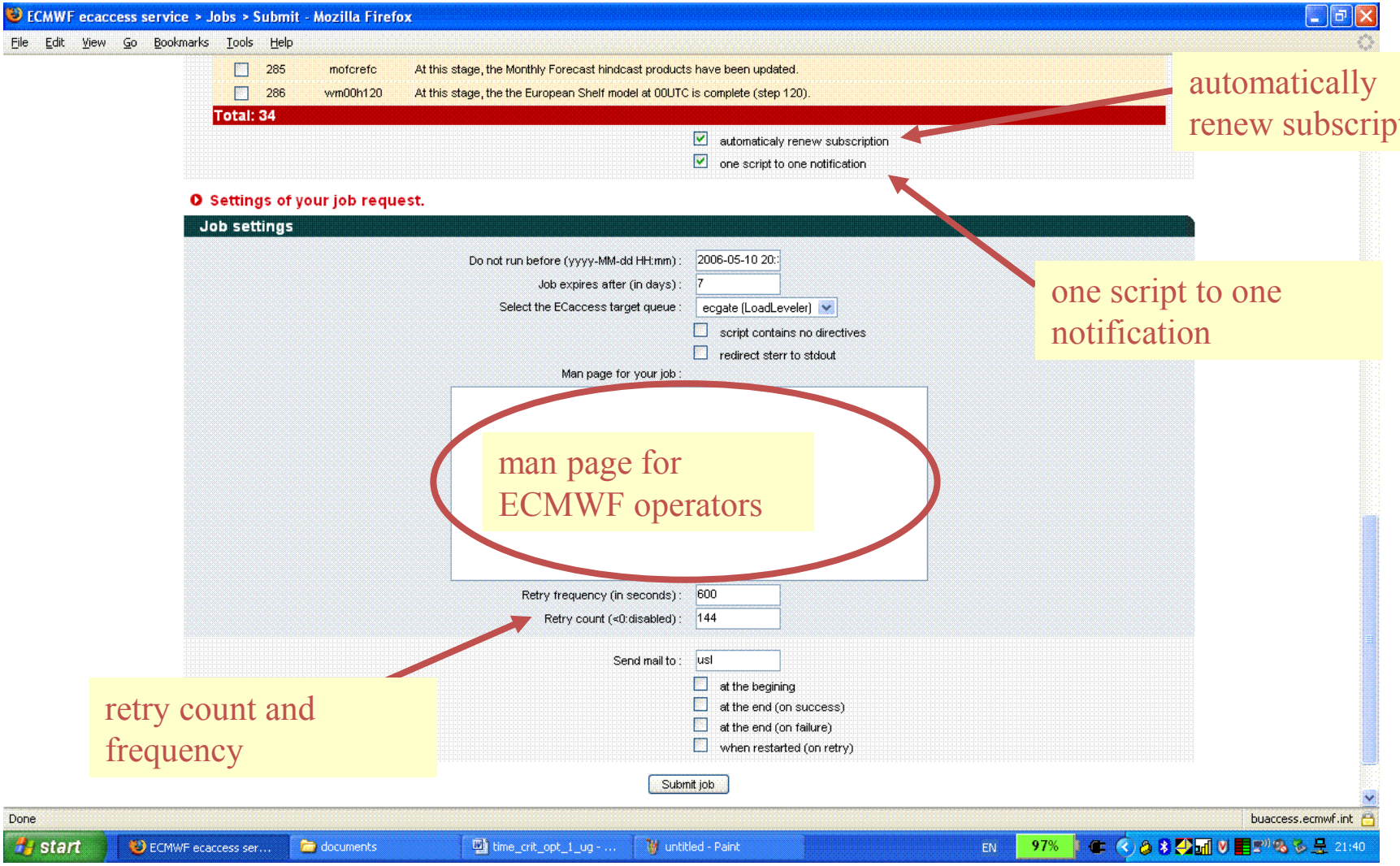
MS time-critical applications: Option 1

- 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.

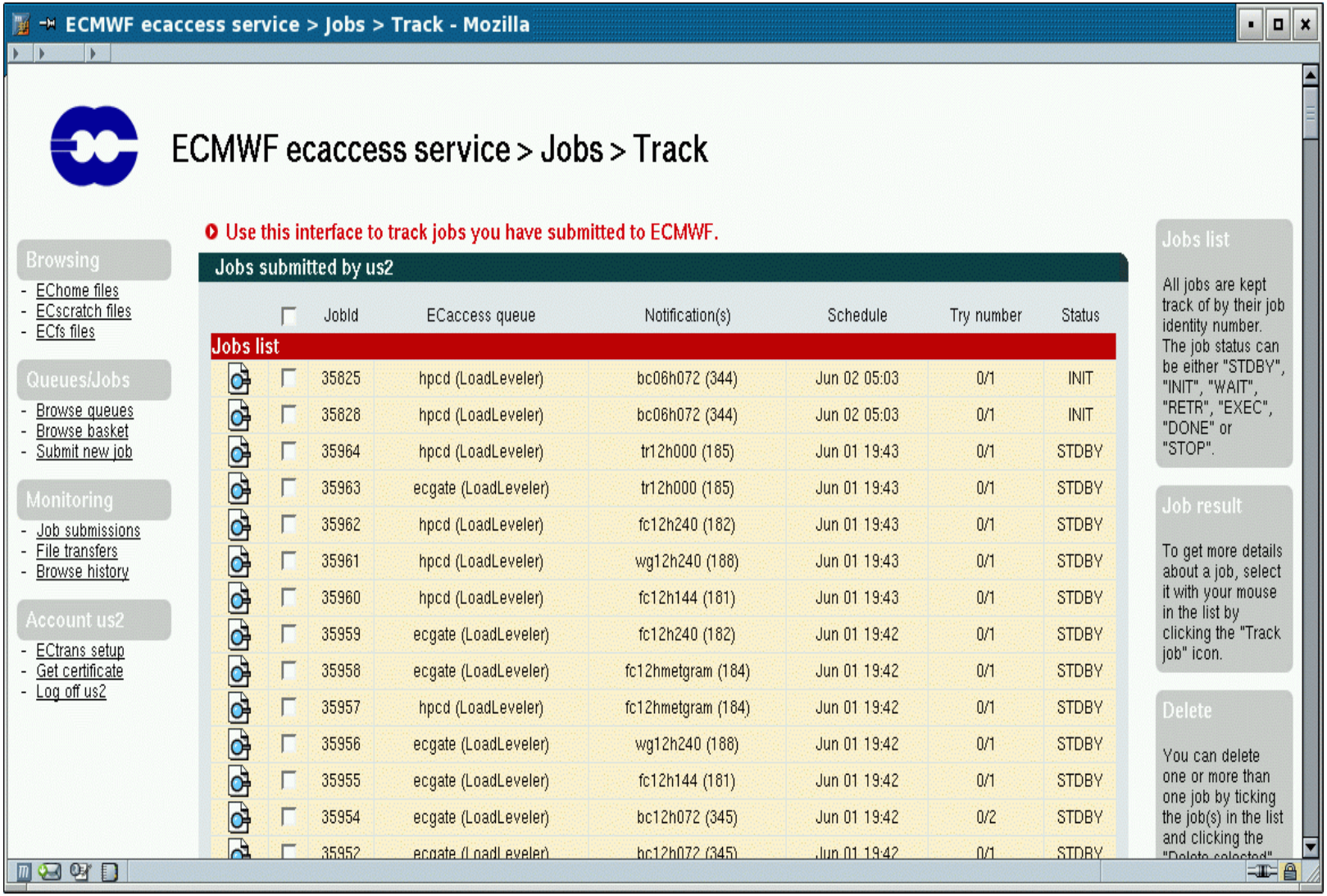
MS time-critical applications: Option 1



MS time-critical applications: Option 1



MS time-critical applications: Option 1



MS time-critical applications: Option 1

- list events available to user:

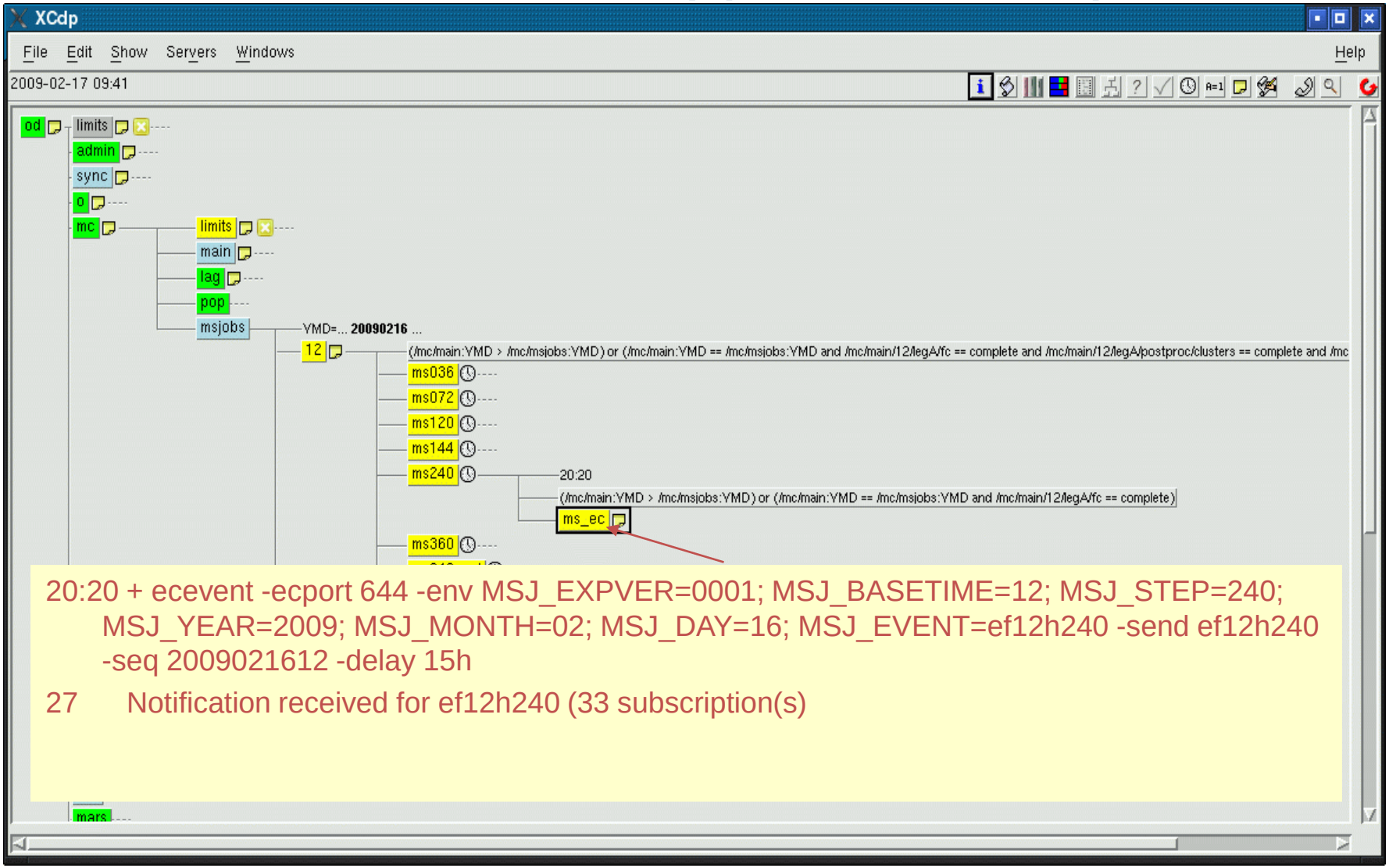
```
> ecaccess-event-list
326   ef00hplumes   At this stage, the EPS plume charts at 00UTC have been updated.
341   ef00h240      At this stage, the ensemble forecast model at 00UTC (step 240) is complete
342   ef12h240      At this stage, the ensemble forecast model at 12UTC - step 240 - is complete
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
```

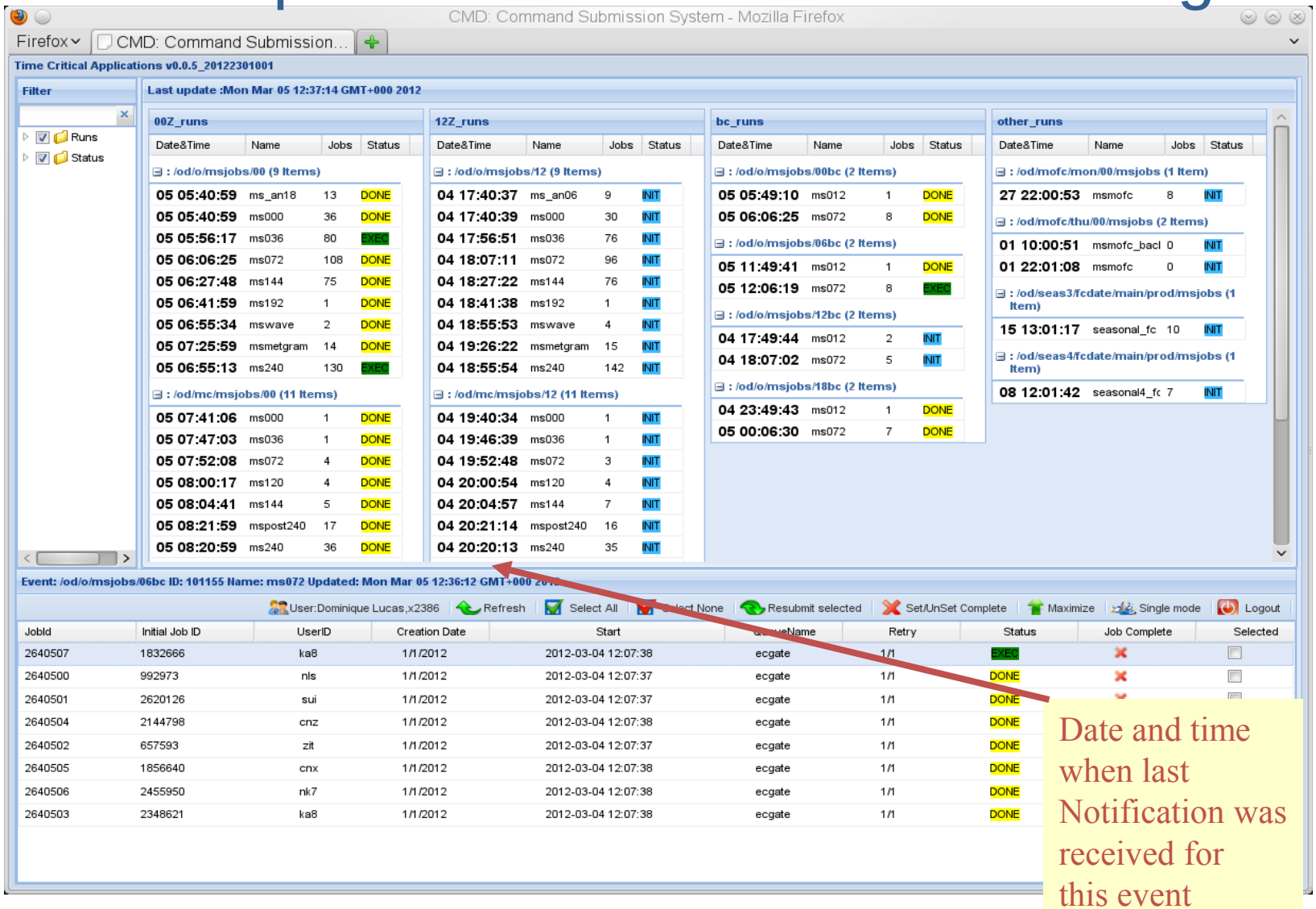
MS time-critical applications: Option 1



20:20 + ecevent -ecport 644 -env MSJ_EXPVER=0001; MSJ_BASETIME=12; MSJ_STEP=240; MSJ_YEAR=2009; MSJ_MONTH=02; MSJ_DAY=16; MSJ_EVENT=ef12h240 -send ef12h240 -seq 2009021612 -delay 15h

27 Notification received for ef12h240 (33 subscription(s)

Operators' interface – monitoring



Management of your own notifications

- Defining events and sending notifications to them:

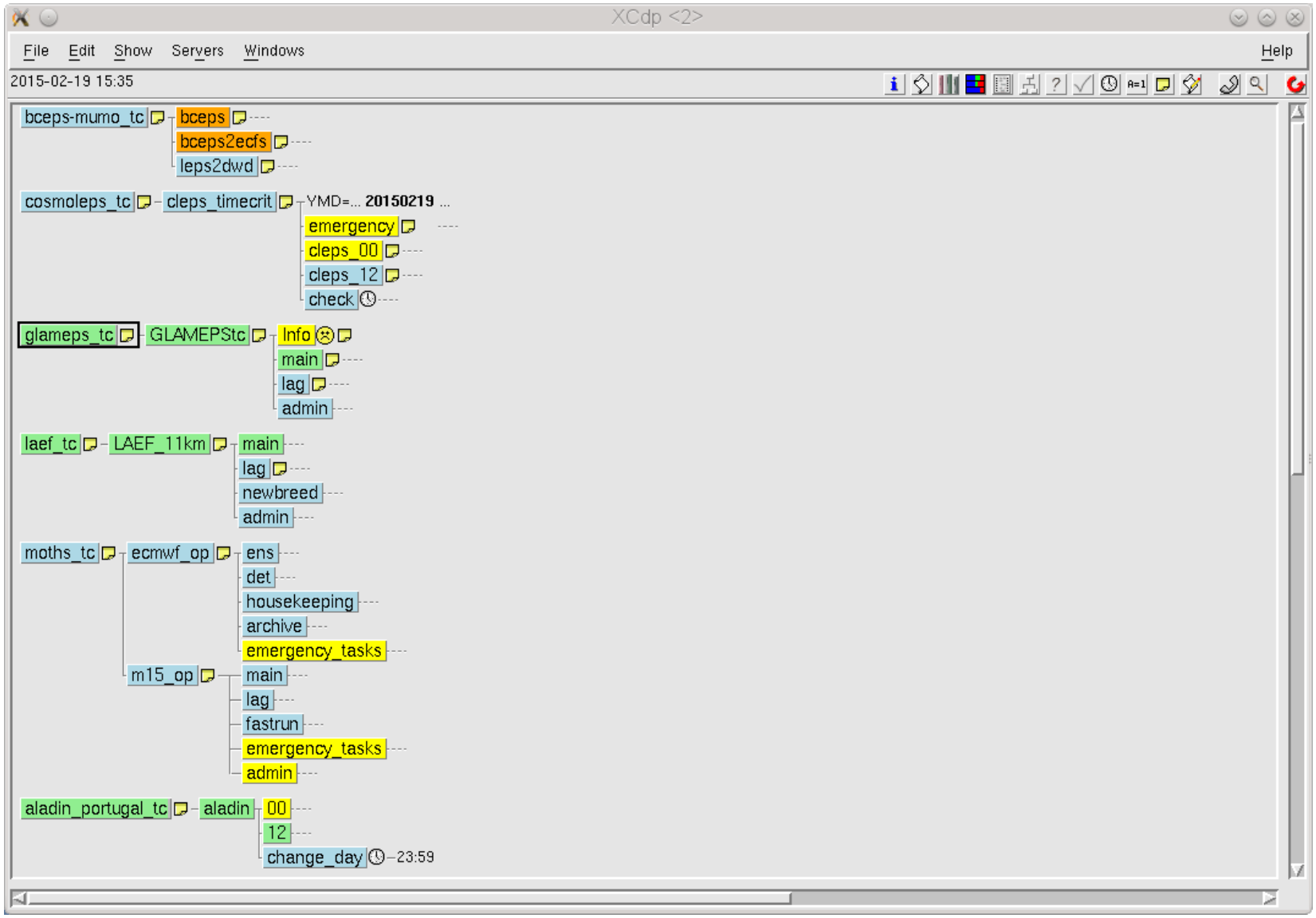
```
> ecevent -help
Usage: ecevent [-create|-send|-clear|-delete|-grant|-update] <MyNotification> \
        [-comment "comment_for_my_notification"] \
        [-public] [-private] [-env "variables_to_pass"] [-seq <number>] \
        [-notify|-subscribe] [-users "list_of_users"]

> 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 among them (e.g. COSMO-LEPS, UKMO EPS, CNMCA)
- 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: glameps



MS time-critical applications: Option 2

- COSMO-LEPS
  - 16+1 COSMO at 7km/40ML up to 132h twice a day at 00/12 UTC
- ALADIN-LAEF for the Austrian Met Service
  - 17 members, 11km/37ML up to 72h twice a day at 00/12 UTC, larger domain
- BC-EPS (MuMo) for German Met Service
  - runs four times a day at 00, 06, 12, and 18 UTC
  - interpolating global model data from GME, GFS, GSM and IFS model to the COSMO-LMI grid.

MS time-critical applications: Option 2

- GLAMEPS for HIRLAM and Belgian Met Service
  - 50 + 4 members, up to 54 hours four times a day.
- MOGREPS15: EPS based on UM as the UKMO contribution to TIGGE
  - 22+2 members at N216L85 up to 360h twice a day at 00/12 UTC
- SSPS for UKMO
  - Twice a day at 00/12UTC based on ECMWF HRES and ENS systems.
- ALADIN for the Portuguese Met Service
  - 9km/46ML up to 72h twice a day at 00/12 UTC

MS time-critical applications: “Option 2”

- COSMO-MED/COSMO-ITA using specific 3D-Var analysis and ECMWF BC for the Italian Met Service
  - 3D-Var assimilation at 14 km every 3 hours
  - COSMO-ME at 7 km up to 78h twice a day at 00/12 UTC
  - NETTUNO at 3 NM up to 72h twice a day at 00/12 UTC
  - COSMO-IT at 2.8 km up to 24h twice a day at 00/12 UTC
  - NETTUNO at 1 NM up to 24h twice a day at 00/12 UTC
- New applications from Iceland and Spain.
- Interest from other countries.

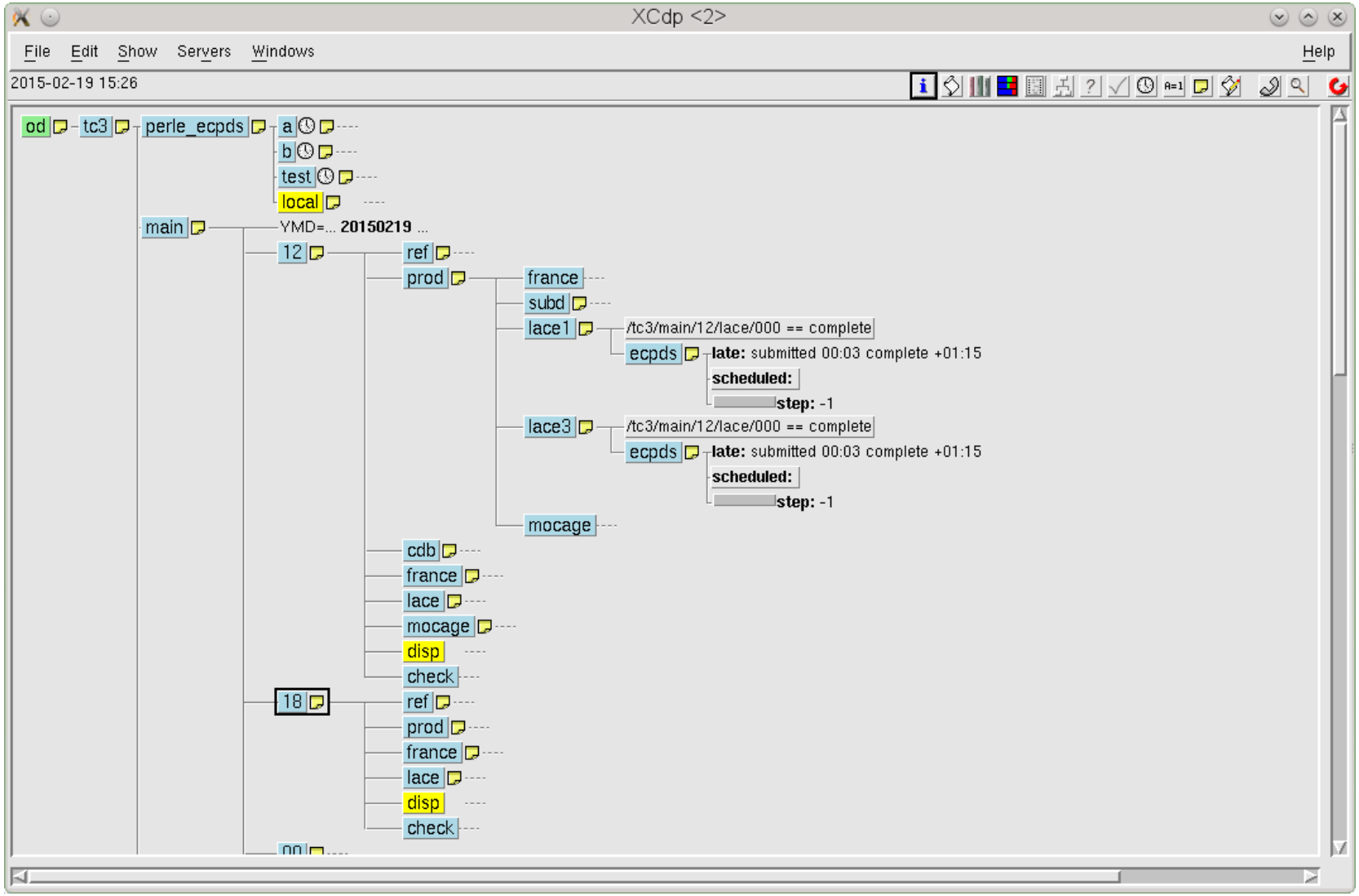
- EUROSIP multi-model seas. forecasts, UKMO Monthly Outlook, CM-SAF routine production and many others.

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 ALADIN:
  - ‘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.
- 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/