ECaccess service

Including Time Critical option 1 service

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ECaccess Concepts

- ECaccess provides a portal to access ECMWF archiving and computing facilities.

  – File and job management in batch or interactive mode through an extended FTP/SFTP server

  – File, job and data transfer management through a Web browser or via command line tools

  – All these services are available on your local system or on the Atos systems at ECMWF

- Strict authentication via soft tokens (TOTP) and X509 certificates.

- Data integrity/confidentiality guaranteed by SSL

ECaccess architecture – multiple tears

- ECaccess Client – on your local system or at ECMWF:
  - ftp/sftp client
  - Web browser
  - ECaccess web Toolkit

- ECaccess Gateway:
  - Entry point for all ECaccess users
  - Verifies user's authentication
  - May be installed at your end
  - Default ECaccess gateway is in Bologna at boaccess.ecmwf.int

ECaccess architecture – multiple tears

- ECaccess server:
  - Located at ECMWF on boaccess.ecmwf.int
  - Entry point for all remote ECaccess gateways
  - Keeps track of ECaccess users' activity

- ECaccess Atos:
  - Provides job management through SLURM (ecs or hpc)
  - Provides access to all ECMWF 'filesystems', including ECFS
  - Manages spool for batch jobs and unattended file transfers

ECaccess local gateways

- Use local ECaccess gateway if installed.

- Internet ECaccess gateways available at over 30 NMSs and other sites.

- If local ECaccess gateway is not available, then use ECMWF gateway on boaccess.ecmwf.int.

- See command 'ecaccess-gateway-list'.

ECaccess interactive sessions

- Web interface: http://boaccess.ecmwf.int/

- (s)ftp access

Notes:

- TOTP authentication required. See https://confluence.ecmwf.int/display/UDOC/Using+Time-based+One-Time+Passwords

- If you have multiple TOTP devices, only the first one can be used for ECaccess.

- For interactive SSH or X11 access, you will have to use teleport or VDI. See

  https://confluence.ecmwf.int/display/UDOC/Teleport+SSH+Access

  https://confluence.ecmwf.int/display/UDOC/How+to+connect+-+Linux+Virtual+Desktop+VDI

ECaccess Web Toolkit

• These ECaccess tools must be installed at your end on each platform for which access to ECMWF services is required.

• Available from https://confluence.ecmwf.int/display/ECAC/Releases+-+Web+Toolkit

• ECaccess Web Toolkit is also available on ECMWF computers:

```
{echost}→ module load ecaccess
```

• Toolkit includes commands:

 – for file management

 – Job management

 – Transfer management

• For general information on the Toolkit, see command 'ecaccess'.

• On remote (non ECMWF) systems, a certificate will be needed to use the Toolkit.

Getting a certificate for ECaccess Web Toolkit

```
remote-host --> ecaccess-certificate-create
Please enter your user-id: <UID>
Your passcode:######
remote-host --> ecaccess-certificate-list
chmod                  168h      Nov 01 09:09        change file mode
deleteFile             168h      Nov 01 09:09        delete file
deleteJob              168h      Nov 01 09:09        delete a job
…
remote-host -->
```

- Certificate valid for 7 days, but this can be extended for special requirements.

- Certificate only needed for file, job and transfer management; it is NOT required for unattended file transfers (see later - ectrans).

- Certificate not needed on ECMWF systems.

Toolkit file management

```
ecaccess-file-chmod           - Change ECaccess File Mode Bits
ecaccess-file-copy            - Copy an ECaccess File
ecaccess-file-delete          - Remove an ECaccess File
ecaccess-file-dir             - List ECaccess Directory Contents
ecaccess-file-get             - Download an ECaccess File
ecaccess-file-mdelete         - Delete Multiple ECaccess Files at once
ecaccess-file-mget            - Download Multiple ECaccess Files at once
ecaccess-file-mkdir           - Make a Directory on the ECaccess File System
ecaccess-file-move            - Move or Rename ECaccess Files
ecaccess-file-put             - Upload a File on the ECaccess File System
ecaccess-file-rmdir           - Remove a Directory on the ECaccess File System
```

- Different ECMWF storage areas , a.k.a. domains or 'File Systems',
  available with the Toolkit, e.g. 'home:' for $HOME, 'ec:' for ECFS …

Toolkit job management

- You can submit shell scripts and batch command files to the SLURM batch systems on Atos (ECS and HPC)

```
ecaccess-job-delete          - Delete an ECaccess Job
ecaccess-job-get             - Download a Job Output/Input/Error File
ecaccess-job-list            - List all ECaccess Jobs
ecaccess-job-restart         - Restart an ECaccess Job
ecaccess-job-submit          - Submit a new ECaccess Job
ecaccess-queue-list          - List available queues
```

- These commands will be used to submit Time Critical option 1 jobs. See later.

File transfers - ectrans

- Unattended file transfers

- Automatic retrial on failure

- Synchronous or asynchronous transfers

- Downloads or uploads

- Secured transfers using sftp, ftps (or ftp).

- Ectrans associations can be set up for various destinations

- Email notification, retry mechanism possible

- Association name is unique on each gateway

- Association has to be created on the specific gateway in use

- Transfers are always initiated from ECMWF

Toolkit ectrans association and transfer management

```
ecaccess-association-delete   – Delete Association
ecaccess-association-get      – Get the Association Descriptive File
ecaccess-association-list     – List your ECtrans associations
ecaccess-association-protocol– List the supported ECtrans Protocol
ecaccess-association-put      – Update/Create an Association

ecaccess-ectrans-delete       – Delete ECtrans
ecaccess-ectrans-list         – List all ectrans transfers
ecaccess-ectrans-request      – Request a new ECtrans transfer
ecaccess-ectrans-restart      – Restart an existing ECtrans transfer
```

- Before being able to use ectrans, you will need to set up an ectrans association

- Any password for your destination host will be given with the '-password' option of 'ecaccess-association-put'. ssh keys can also be used.

- See https://confluence.ecmwf.int/display/ECAC/Unattended+file+transfer+-+ectrans for more information on ectrans associations.

ectrans command – available at ECMWF only

```
{echost}→ ectrans –help
usage: ectrans [–gateway name] –remote msuser@[destination] \
         [–get|-put] –source [<domain>:]filename [args ...]
       ectrans –check requestID

 –gateway  {arg} – access gateway name
 –remote   {arg} – access method, i.e. the association name
 –source   {arg} – source file name
 –target   {arg} – target file name (default: same as –source)
 -retryCnt {arg} – define the number of retries (default: async=144, sync=0)
 -priority {arg} – transmission priority 0–99 (default: 99) (****)
 –put            – interactive/synchronous transfer (no spool)
 –get            – interactive/synchronous pull (rather than push) file
 –overwrite      – if existing target file
…
```

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ectrans command – example

```
{echost}→ ectrans –remote ectrans_ecacc –source pl.grib –verbose
verbose: gateway=boaccess.ecmwf.int
verbose: echost=boleccmd.ecmwf.int
verbose: ecport=644
verbose: action=spool
verbose: ecuser=<UID>
verbose: source=pl.grib
verbose: target=pl.grib

…
verbose: 19682640 bytes to upload
168950086
{echost}→ ecaccess-ectrans-list
168950086  COPY        ectrans_ecacc          boaccess.ecmwf.int    Oct 25 11:41
{echost}→
```

ECaccess based Time Critical service – Option 1

- Simple job submissions following ECMWF operational activity.

- Jobs monitored by ECMWF

- ECaccess events, a.k.a. notifications:

  – One user (at ECMWF) defines ECaccess events

```
→ ecaccess-event-list
167  an00h000    At this stage, the analysis at 00UTC is complete.
168  an12h000    At this stage, the analysis at 12UTC is complete.
178  fc00h240    At this stage, the deterministic forecast at 00UTC for
step 240 (10 days) is complete.
…
```

  – About 100 ECaccess events defined by ECMWF

  – See ECMWF products' dissemination schedule
    https://confluence.ecmwf.int/display/DAC/Dissemination+schedule

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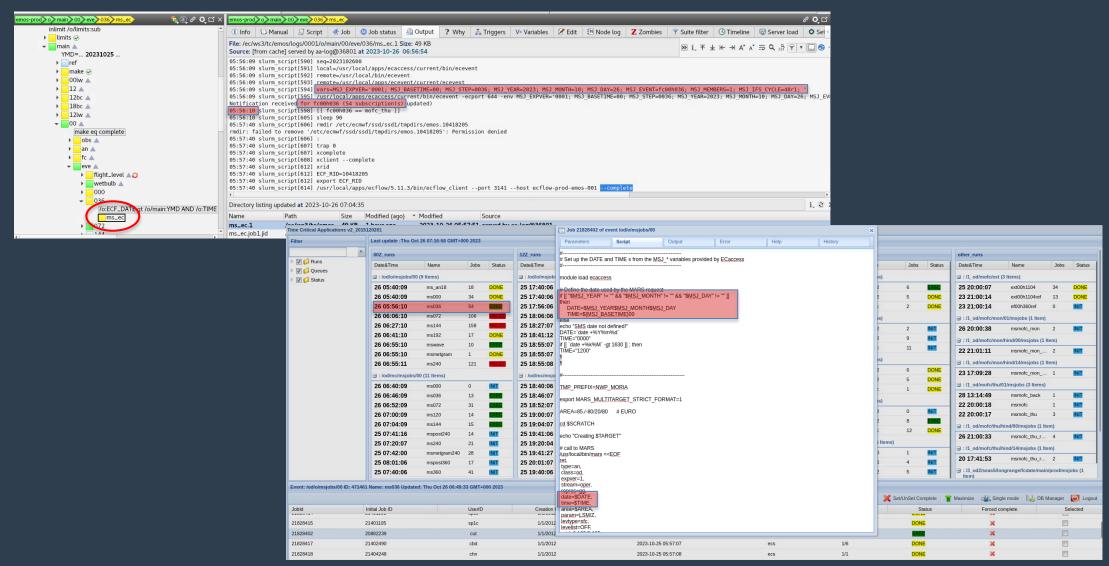
ECaccess based Time Critical service – Option 1

- Users can submit jobs to an event, using ecaccess-job-submit:

```
→ ecaccess-job-submit –help
   ecaccess-job-submit [-eventIds list] [-manPage content]
   [-retryCount number] [-retryFrequency frequency] source
→ ecaccess-job-submit –eventIds fc00h240 –retryCount 2 test_tc1.cmd
21829756
→ ecaccess-job-list
21829756    ecs         STDBY      0/3    Oct 25 13:28   [fc00h240 (178)]
test_tc1.cmd
```

- The ECaccess job will be in STANDBY mode, until the owner of the event sends a notification to the event.

- With the notification, the owner can pass environmental variables. These will be available in the TC-1 batch job

- ECaccess will submit the job to the batch system (SLURM) on Atos (ECS or HPC)

- Shortly after submitting a TC-1 job, ECaccess will duplicate the same job and put it in STANDBY mode, ready for the next notification of the event.

ECaccess based Time Critical service – Option 1

ECaccess based Time Critical service – Option 1

- 100+ users submitting 1500+ jobs per day to 80+ ECaccess events.

- TC-1 service is open to any user with login access to Atos (ecs and/or hpc) …

- … with access to real time data in MARS.

- ECaccess events system can be – and is – used for other activities, e.g. Copernicus activities, TC-2 activities …

- TC-1 sample SLURM job available at

https://confluence.ecmwf.int/display/UDOC/HPC2020%3A+realtime_metgram.sh

ECaccess references

- ECaccess user guide

  https://confluence.ecmwf.int/display/ECAC/User+Guide

- ECaccess Web Toolkit

  https://confluence.ecmwf.int/display/ECAC/Web+Toolkit+-
  +The+full+featured+client

- ECaccess – ectrans

  https://confluence.ecmwf.int/display/ECAC/Unattended+file+transfer+-
  +ectrans

- ECaccess Time Critical option 1 service

  https://confluence.ecmwf.int/display/UDOC/Simple+time-critical+jobs

- ECaccess tutorial

  https://confluence.ecmwf.int/display/UDOC/ECaccess+and+ECaccess+Web+
  Toolkit+tutorial