

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

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

```
...
```

ectrans command – example

```
{echohost}→ ectrans -remote ectrans_ecacc -source pl.grib -verbose
verbose: gateway=boaccess.ecmwf.int
verbose: echohost=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
{echohost}→ ecaccess-ectrans-list
168950086 COPY          ectrans_ecacc          boaccess.ecmwf.int    Oct 25 11:41
{echohost}→
```

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>

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

```

File: /ec/ws3/tc/emos/0001/o/main/00/eve/036/ms_ec.1 Size: 49 KB
Source: [from cache] served by aa-log@36801 at 2023-10-26 06:56:54
05:56:09 slurm_script[590] seq=2023102600
05:56:09 slurm_script[591] local=/usr/local/apps/ecaccess/current/bin/ecevent
05:56:09 slurm_script[592] remote=/usr/local/bin/ecevent
05:56:09 slurm_script[593] remote=/usr/local/apps/ecaccess/current/ecevent
05:56:09 slurm_script[594] vars=MSJ_EXPVER=0801; MSJ_BASETIME=08; MSJ_STEP=0036; MSJ_YEAR=2023; MSJ_MONTH=10; MSJ_DAY=26; MSJ_EVENT=fc00h036; MSJ_MEMBERS=1; MSJ_IFS_CYCLE=48r1;
05:56:09 slurm_script[595] /usr/local/apps/ecaccess/current/bin/ecevent -ecport 644 -env MSJ_EXPVER=0801; MSJ_BASETIME=08; MSJ_STEP=0036; MSJ_YEAR=2023; MSJ_MONTH=10; MSJ_DAY=26; MSJ_EV
Notification received for fc00h036 (54 subscription(s) updated)
05:56:10 slurm_script[598] [[ fc00h036 == mofc_thu ]]
05:56:10 slurm_script[605] sleep 90
05:57:40 slurm_script[606] rmdir /etc/ecmf/ssd/ssd1/tmpdirs/emos.10418205
rmdir: failed to remove /etc/ecmf/ssd/ssd1/tmpdirs/emos.10418205: Permission denied
05:57:40 slurm_script[606] :
05:57:40 slurm_script[607] trap 0
05:57:40 slurm_script[607] xcmpt
05:57:40 slurm_script[608] xclint --complete
05:57:40 slurm_script[612] xcrd
05:57:40 slurm_script[612] ECF_RID=10418205
05:57:40 slurm_script[612] export ECF_RID
05:57:40 slurm_script[614] /usr/local/apps/ecflow/5.11.3/bin/ecflow_client --port 3141 --host ecflow-prod-emos-081 --complete
Directory listing updated at 2023-10-26 07:04:35
Name Path Size Modified (ago) Modified Source
ms_ec.1 /ec/ws3/tc/emos/0001/o/main/00/eve/036/ms_ec.1 49 KB 2023-10-26 06:56:54 served by aa-log@36801
ms_ec.job1.jid
    
```

Time Critical Applications v2.2015120201

Filter

Date&Time	Name	Jobs	Status
26 05:40:09	ms_an18	18	DONE
26 05:40:09	ms000	34	DONE
26 05:56:10	ms036	54	FAILED
26 06:06:10	ms072	106	FAILED
26 06:27:10	ms144	158	FAILED
26 06:41:10	ms192	17	DONE
26 06:55:10	mswave	10	DONE
26 06:55:10	msmetgram	1	DONE
26 06:55:11	ms240	121	FAILED

```

# Set up the DATE and TIME s from the MSJ_* variables provided by ECaccess
module load ecaccess
# Define the date used by the MARS request
if [[ $MSJ_YEAR != "" && $MSJ_MONTH != "" && $MSJ_DAY != "" ]]
then
DATE=$MSJ_YEAR$MSJ_MONTH$MSJ_DAY
TIME=$MSJ_BASETIME$00
fi
echo "SMS date not defined!"
DATE= date +%Y%m%d
TIME="0000"
if [[ `date +%k%M` -gt 1630 ]]; then
TIME="1200"
fi
TMP_PREFIX=NWP_MORIA
export MARS_MULTITARGET_STRICT_FORMAT=1
AREA=85 /-80/20/80 # EURO
cd $SCRATCH
echo "Creating TARGET"
# call to MARS
/usr/local/bin/mars <<EOF
fct
type=an,
class=od,
expver=1,
stream=oper,
app=ecflow
date=$DATE
time=$TIME
area=$AREA
param=LSMZ,
levtype=sfc,
levelist=OFF,
    
```

JobID	Initial Job ID	UserID	Creation	2023-10-25 05:57:07	ecs	1/6
21828415	2140105	sp1c	1/1/2012			
21828402	20882239	cut	1/1/2012			
21828417	21402490	cbd	1/1/2012			
21828418	21404248	chn	1/1/2012			

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](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>