



Introduction to the Gateway and IMAS environment setup

Dmitriy Yadykin, Michal Owsiak, Bartek Palak and PSNC ACH team



CHALMERS
UNIVERSITY OF TECHNOLOGY



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- Gateway
 - login
 - first steps
 - file system structure
 - access rights and database setup
- IMAS environment setup
 - loading modules
 - imasenv
- Example routines



Working environment and documentation pages

wiki page: wiki.eufus.eu

The screenshot shows the 'Eurofusion Gateway Wiki' page. At the top, there are logos for EUROfusion (GATEWAY EUFUS.EU), ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development), and CINECA/SCAI (Supercomputing Applications and Innovation). A search bar and navigation links (Recent Changes, Media Manager, Sitemap) are visible. The main heading is 'GATEWAY ENEA CINECA'. Below it, the text reads: 'Welcome to the EUROfusion Gateway infrastructure within the new premises of CINECA (Bologna-Italy). ENEA/CINECA are going to support the infrastructure for the next 2 years starting from Jan.1st 2017. The Gateway infrastructure is interoperable with the EUROfusion HPC facility. Gateway username/password is required in order to access the Gateway Wiki Documents. If you have forgotten Gateway username/password please send an email to Gateway support inserting the following:'. A 'Table of Contents' sidebar on the right lists: GATEWAY ENEA CINECA, How to get a user account, Gateway User Agreement, and MARCONI/GATEWAY status.

hardware resources
software resources
ticketing system

Working nodes:

login nodes (s51-s54)

batch nodes

Connection:

use NX client, here are the instructions:

https://wiki.eufus.eu/doku.php?id=nx_remote_conn

other means of connection exist check the wiki pages

NX session configuration



No-machine client configuration:

protocol: ssh (nx protocol is also possible)

host: s51-54.eufus.eu

authentication: use system login+password

network connection: don't use proxy

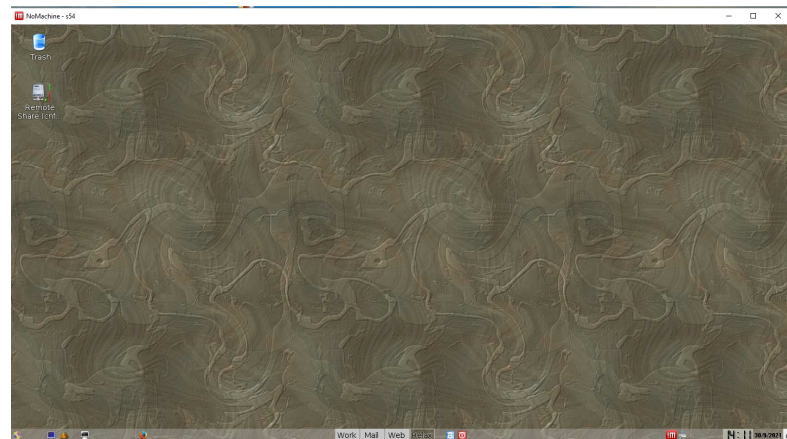
name: choose whatever you like (I usually leave just s51_54)

Check for more information

https://wiki.eufus.eu/doku.php?id=namespace:connecting_to_the_gateway

Login:

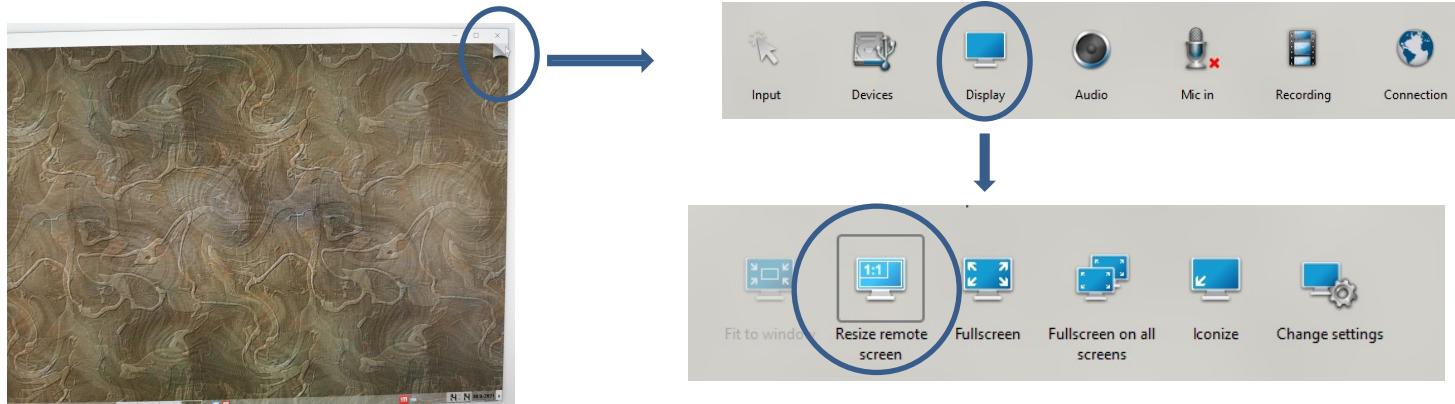
- input your username (g2...) and password
- choose 'Create new virtual desktop' (or choose existing one if you login to the active session)



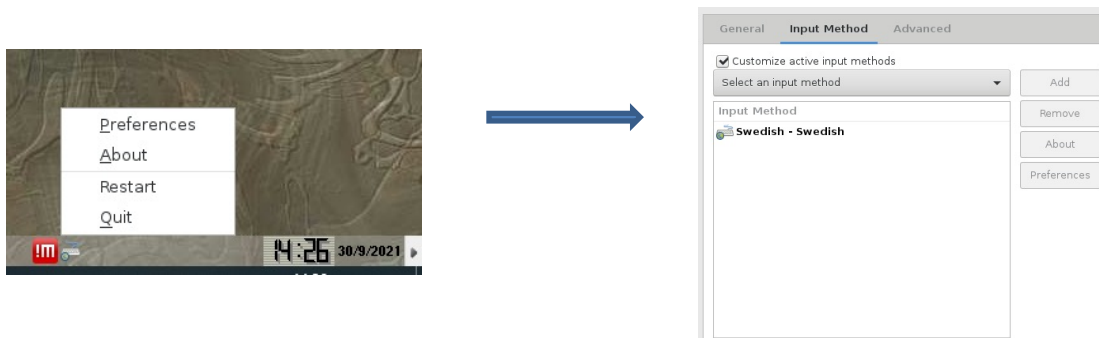
First steps



Configure the way NX window is displayed



Keyboard language settings



File system structure



- Historically there are two file systems:
 - afs (\$HOME,public)
 - pfs (work area, scratch area)
- Notes:
 - memory quota is limited on AFS
 - afs system is not seen from the batch nodes
 - environment variables exist pointing to the pfs work and scratch areas:
 - \$ITMWORK for /pfs/work/\$USER
 - \$ITMSCRATCH for /pfs/scratch/\$USER
- Recommendation:
 - keep you private data in your \$HOME (rwx-----)
 - keep your work relevant folders (like database) in \$ITMWORK(rwxr-xr-x)
 - keep your temporary data in \$ITMSCRATCH (rwxrwxrwx)

Access rights and database setup



- **Access rights** is useful to set up to give access to your data/codes to other people.
- **Database setup** should be done before you start to work with the data
- Scripts that can be used to setup access rights (on both pfs (database access) and afs (public access)) and database setup can be copied from `~g2diy/public/gateway_intro_21`
- Script ***access.sh*** can be run to check or to set access rights:
 - `./access.sh get` - to check access rights
 - `./access.sh setafs` - to set read access rights for your public
 - `./access.sh setpfs` - to set read access to your pfs folders
- Script ***additional_setup.sh*** can be run to link the pfs folder to your home and setup database placeholder (access layer routines expect database in the `$HOME/public` folder, so you would need to create a link from `pfs/work/$USER` if you create placeholder there)
- Check the contents of the scripts and modify them you want to set custom access rights or additional settings
- More on access rights on the Gateway:
<https://docs.psnc.pl/pages/viewpage.action?pageId=33718750>

IMAS environment setup



- **IMAS environment** is loaded using environment modules
- Minimal set of modules is available on login

```
Shell - Konsole <0>
Session Edit View Bookmarks Settings Help
<g2cpt@es54 ~>module list
Currently Loaded Modulefiles:
  1) profile/archive  2) cineca
<g2cpt@es54 ~>
```

- IMAS environment is based on **IMAS** module
- Several versions of **IMAS** module (following evolution of the IMAS ecosystem) are available

```
<g2cpt@es54 ~>module avail IMAS
----- /gw/swimas/etc/modulefiles -----
IMAS/3.21.1-4.0.0      IMAS/3.23.1-4.0.4      IMAS/3.23.2/AL/develop  IMAS/3.26.0/AL/4.4.0      IMAS/3.29.0/AL/4.8.3
IMAS/3.21.1-4.0.1      IMAS/3.23.1-4.0.4-8-g2da2d94  IMAS/3.24.0/AL/4.1.5      IMAS/3.26.0/AL/4.7.2      IMAS/3.30.0/AL/4.8.5
IMAS/3.22.0-4.0.2      IMAS/3.23.2/AL/4.1.0      IMAS/3.24.0/AL/4.2.0      IMAS/3.27.0/AL/4.6.0/GCC/4.8  IMAS/3.31.0/AL/4.8.7
IMAS/3.23.1/AL/4.0.3    IMAS/3.23.2/AL/4.1.1      IMAS/3.25.0/AL/4.2.0      IMAS/3.28.0/AL/4.7.2      IMAS/3.31.0/AL/develop
IMAS/3.23.1/AL/4.0.4    IMAS/3.23.2/AL/4.1.2      IMAS/3.25.0/AL/4.3.1      IMAS/3.28.1/AL/4.7.2      IMAS/3.32.0/AL/4.9.0
IMAS/3.23.1/AL/4.1.0    IMAS/3.23.2/AL/4.1.4      IMAS/3.25.0/AL/4.3.1_gcc_7.3.0  IMAS/3.28.1/AL/4.8.0      IMAS/3.32.1/AL/4.9.1
IMAS/3.23.1-4.0.3      IMAS/3.23.2/AL/4.1.5      IMAS/3.25.0/AL/4.4.0      IMAS/3.28.1/AL/4.8.3      IMAS/3.33.0/AL/4.9.1
IMAS/3.23.1-4.0.3-92-gb82db6f  IMAS/3.23.2/AL/70f88de2bc9  IMAS/3.25.0/AL/4.4.0_gcc_7.3.0  IMAS/3.28.1/AL/develop  IMAS/3.33.0/AL/4.9.2
```


IMAS environment setup



- **IMAS** module is named as:
IMAS/*DataDictionary_version*/AL/*Access_layer_version*
- Latest **IMAS** module at the moment is
IMAS/3.33.0/AL/4.9.2
- Loading **IMAS** module will load also
additional/dependent modules

```
<g2cpt@es54 ~>module load IMAS/3.33.0/AL/4.9.2
<g2cpt@es54 ~>module list
Currently Loaded Modulefiles:
  1) profile/archive          5) gnu/7.3.0                9) itm-java/1.8.0_111      13) uda/2.2.5
  2) cineca                  6) itm-gcc/7.3.0           10) itm-python/3.7         14) matlab/2018b
  3) intel/pe-xe-2017--binary 7) intelmpi/2017--binary  11) mdsplus/7.92.0/gcc/6.1 15) itm-matlab/2018b
  4) itm-intel_/17.0          8) jdk/1.8.0_111          12) blitz/1.0.1           16) IMAS/3.33.0/AL/4.9.2
```

- Modules with *itm-* prefix are patched by the CPT/ACH team to be compatible with the conventions used in the EU-IM modelling platform (defining pkg-config shortcuts for example)

IMAS environment setup



- **imasenv** module includes extended list of the modules usually used by the users of EU-IM platform
- **imasenv** follows the evolution of the **IMAS** module (have similar naming conventions)

```
<g2cpt@es54 ~>module avail imasenv
----- /gw/modules/environment -----
imasenv/3.10.2          imasenv/3.22.0/uwl/4.0.2/1.1  imasenv/3.23.1/uwl/4.0.4/1.2  imasenv/3.25.0/gcc/7.3.0/rc  imasenv/3.28.1/intel/17.0/1.0  imasenv/3.31.0/gcc/7.3.0/1.1  imasenv/3.33.0/intel/rc
imasenv/3.11.0          imasenv/3.22.0/uwl/4.0.2/1.2  imasenv/3.23.1/uwl/4.1.0/1.0  imasenv/3.25.0/gcc/rc        imasenv/3.28.1/intel/17.0/rc  imasenv/3.31.0/gcc/7.3.0/rc  imasenv/3.33.0/rc
imasenv/3.12.1          imasenv/3.22.0/uwl/4.0.2/1.3  imasenv/3.23.2/rc            imasenv/3.25.0/intel/17.0/1.0  imasenv/3.28.1/intel/rc      imasenv/3.31.0/intel/17.0/1.0  imasenv/3.7.4
imasenv/3.15.1          imasenv/3.22.0/uwl/4.0.2/1.4  imasenv/3.23.2/uwl/4.1.1/1.0  imasenv/3.25.0/intel/17.0/rc  imasenv/3.28.1/rc           imasenv/3.31.0/intel/17.0/1.1  imasenv/3.8.0
imasenv/3.16.0          imasenv/3.22.0/uwl/4.0.2/1.5  imasenv/3.23.2/uwl/4.1.2/0.2  imasenv/3.25.0/intel/rc      imasenv/3.29.0/gcc/7.3.0/1.0  imasenv/3.31.0/intel/17.0/rc  imasenv/3.9.0
imasenv/3.17.0          imasenv/3.22.0/uwl/4.0.2/1.6  imasenv/3.23.2/uwl/4.1.2/1.0  imasenv/3.25.0/rc           imasenv/3.29.0/gcc/7.3.0/rc  imasenv/3.31.0/intel/rc       imasenv/3.9.1
imasenv/3.17.1          imasenv/3.22.0/uwl/4.0.2/1.7  imasenv/3.23.2/uwl/4.1.4/0.2  imasenv/3.25.0/uwl/4.2.0/1.0  imasenv/3.29.0/intel/17.0/1.0  imasenv/3.31.0/rc            imasenv/newLL/3.18.0
imasenv/3.18.0          imasenv/3.22.0/uwl/4.0.2/1.8  imasenv/3.23.2/uwl/4.1.4/1.0  imasenv/3.26.0/gcc/7.3.0/rc  imasenv/3.29.0/intel/17.0/rc  imasenv/3.32.0/gcc/7.3.0/rc   imasenv/test
imasenv/3.19.0          imasenv/3.23.1/uwl/4.0.3/1.0  imasenv/3.23.2/uwl/4.1.5/1.0  imasenv/3.26.0/intel/17.0/rc  imasenv/3.29.0/intel/rc      imasenv/3.32.0/intel/17.0/rc  imasenvX/3.19.1/uwl/3.8.2/1.0
imasenv/3.19.1          imasenv/3.23.1/uwl/4.0.3/1.1  imasenv/3.23.2/uwl/4.1.5/1.1  imasenv/3.26.0/intel/rc     imasenv/3.29.0/rc           imasenv/3.32.0/intel/rc       imasenvX/3.20.0/uwl/3.8.3/1.0
imasenv/3.20.0          imasenv/3.23.1/uwl/4.0.3/1.2  imasenv/3.23.2/uwl/4.1.5/1.2  imasenv/3.26.0/rc          imasenv/3.30.0/gcc/7.3.0/rc  imasenv/3.32.0/rc           imasenvX/3.20.0/uwl/3.8.5/1.0
imasenv/3.21.0/uwl/3.8.10/1.0  imasenv/3.23.1/uwl/4.0.3/1.3  imasenv/3.24.0/rc            imasenv/3.28.0/gcc/7.3.0/rc  imasenv/3.30.0/intel/17.0/rc  imasenv/3.32.1/gcc/7.3.0/rc   imasenvX/3.21.0/uwl/3.8.5/1.0
imasenv/3.21.0/uwl/3.8.5/1.0  imasenv/3.23.1/uwl/4.0.3/1.4  imasenv/3.24.0/uwl/4.1.5/1.0  imasenv/3.28.0/intel/17.0/rc  imasenv/3.30.0/intel/rc      imasenv/3.32.1/intel/17.0/rc  imasenvX/3.21.0/uwl/3.8.5/1.0
imasenv/3.21.0/uwl/3.8.8/1.0  imasenv/3.23.1/uwl/4.0.3/1.5  imasenv/3.24.0/uwl/4.2.0/1.0  imasenv/3.28.0/intel/rc     imasenv/3.30.0/rc           imasenv/3.32.1/intel/rc       imasenvX/3.21.0/uwl/3.8.5/1.0
imasenv/3.21.1/uwl/4.0.0/1.0  imasenv/3.23.1/uwl/4.0.3/1.6  imasenv/3.25.0/gcc/6.1.0/1.0  imasenv/3.28.0/rc          imasenv/3.31.0/1.0          imasenv/3.32.1/rc           imasenvX/3.21.0/uwl/3.8.5/1.0
imasenv/3.21.1/uwl/4.0.1/1.0  imasenv/3.23.1/uwl/4.0.4/1.0  imasenv/3.25.0/gcc/6.1.0/rc   imasenv/3.28.1/gcc/7.3.0/1.0  imasenv/3.31.0/1.1          imasenv/3.33.0/gcc/7.3.0/rc   imasenvX/3.21.0/uwl/3.8.5/1.0
imasenv/3.22.0/uwl/4.0.2/1.0  imasenv/3.23.1/uwl/4.0.4/1.1  imasenv/3.25.0/gcc/7.3.0/1.0  imasenv/3.28.1/gcc/7.3.0/rc  imasenv/3.31.0/gcc/7.3.0/1.0  imasenv/3.33.0/intel/17.0/rc
```

- **imasenv** module is compiler oriented separating **intel** and **gnu** compiler stacks (also separation is not full)
- **imasenv** module can be in **release_candidate (rc)** state meaning that modifications can be done ‘on the fly’ and in the **release** state (with number at the end) meaning that the set of modules used in this version will not be modified for this version
- latest version of imasenv module presently is **imasenv/3.33.0/rc**

```
<g2cpt@es54 ~>module load imasenv/3.33.0/rc
```

IMAS environment loaded.

```
<g2cpt@es54 ~>module list
```

Currently Loaded Modulefiles:

- | | | | | |
|-----------------------------|----------------------------|----------------------------|---------------------------------------|---|
| 1) profile/archive | 12) matlab/2018b | 23) itm-fftw/3.3.4 | 34) zlib/1.2.8-gnu--6.1.0 | 45) imas-viz/2.4.1 |
| 2) cineca | 13) itm-matlab/2018b | 24) psp/line/20161207 | 35) itm-hdf5/1.8.17-0ld | 46) idstools/1.7.1 |
| 3) intel/pe-xe-2017--binary | 14) netbeans/7.3 | 25) slatec/4.1 | 36) itm-blas/3.8.0/intel/17.0 | 47) autoGui/1.16 |
| 4) itm-intel/17.0 | 15) itm-maven/3.3.9 | 26) itm-mkl/2017.1 | 37) itm-lapack/3.8.0/intel/17.0 | 48) ggd/1.10.0/intel/17.0/imas/3.33.0 |
| 5) intelmpi/2017--binary | 16) scripts/R4.9 | 27) itm-mathea/1.1.11 | 38) interpos/9.2.0/intel/17.0 | 49) libbds/1.0.2/intel/17.0/imas/3.33.0 |
| 6) itm-intelmpi/2017 | 17) totalview/2017.3.8 | 28) itm-netcdf/4.4 | 39) xmllib/3.3.1/intel/17.0 | 50) ams/1.3.3/intel/17.0/imas/3.33.0 |
| 7) gnu/7.3.0 | 18) cmake/3.5.2 | 29) nag/mark26--binary | 40) libfortranparser/0.0.6/intel/17.0 | 51) imasenv/3.33.0/rc |
| 8) itm-gcc/7.3.0 | 19) mdsplus/7.92.0/gcc/4.8 | 30) itm-nag/mark26--binary | 41) keplertools/1.8.9 | |
| 9) jdk/1.8.0_111 | 20) blitz/1.0.1 | 31) uda/2.2.5 | 42) kepler/2.5p5-3.1.1 | |
| 10) itm-java/1.8.0_111 | 21) jaxfront/R1.1 | 32) IMAS/3.33.0/AL/4.9.1 | 43) imas-fc2k/4.13.9 | |
| 11) itm-python/3.7 | 22) git/2.23 | 33) szip/2.1--gnu--6.1.0 | 44) itm-qt/5.8.0 | |

IMAS environment setup



Notes/warnings:

- Both **IMAS** and **imasenv** modules have default versions, so when typing *module load IMAS (or module load imasenv)* the default version is loaded, and this version could be not the latest one
- **intel** version of **imasenv** module is loaded by default (if compiler option is not specified)

Optional steps:

- *module load* command can be put in separate shell file that can be aliased from `.bashrc` (it is not recommended to put module load commands directly in `.bashrc`)

Simple example: Fortran test routine



- Folder with example files is in the *gateway_intro_21*
- Folder name is `fortran_test`. It contains:
 - slightly modified test routine from the Fortran examples in
 - Makefile to be used to compile the source code
- To compile the code: ***make exe***
- To run executable: ***bin/test.exe***