Adoption of the UNICORE middleware amongst ICM users

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Motivation

- Growing need for use of CPU intensive applications in new user community
- Distributed resources available
- Requirement for seamless access
- Web portal as preferred access method
- Existing web portals are complicated, difficult to install and maintain
- Requirement for strong security
  - processing of medical data (images, NGS, etc).
- Uniform offer for different types of users
  - PL-Grid community
  - ICM users

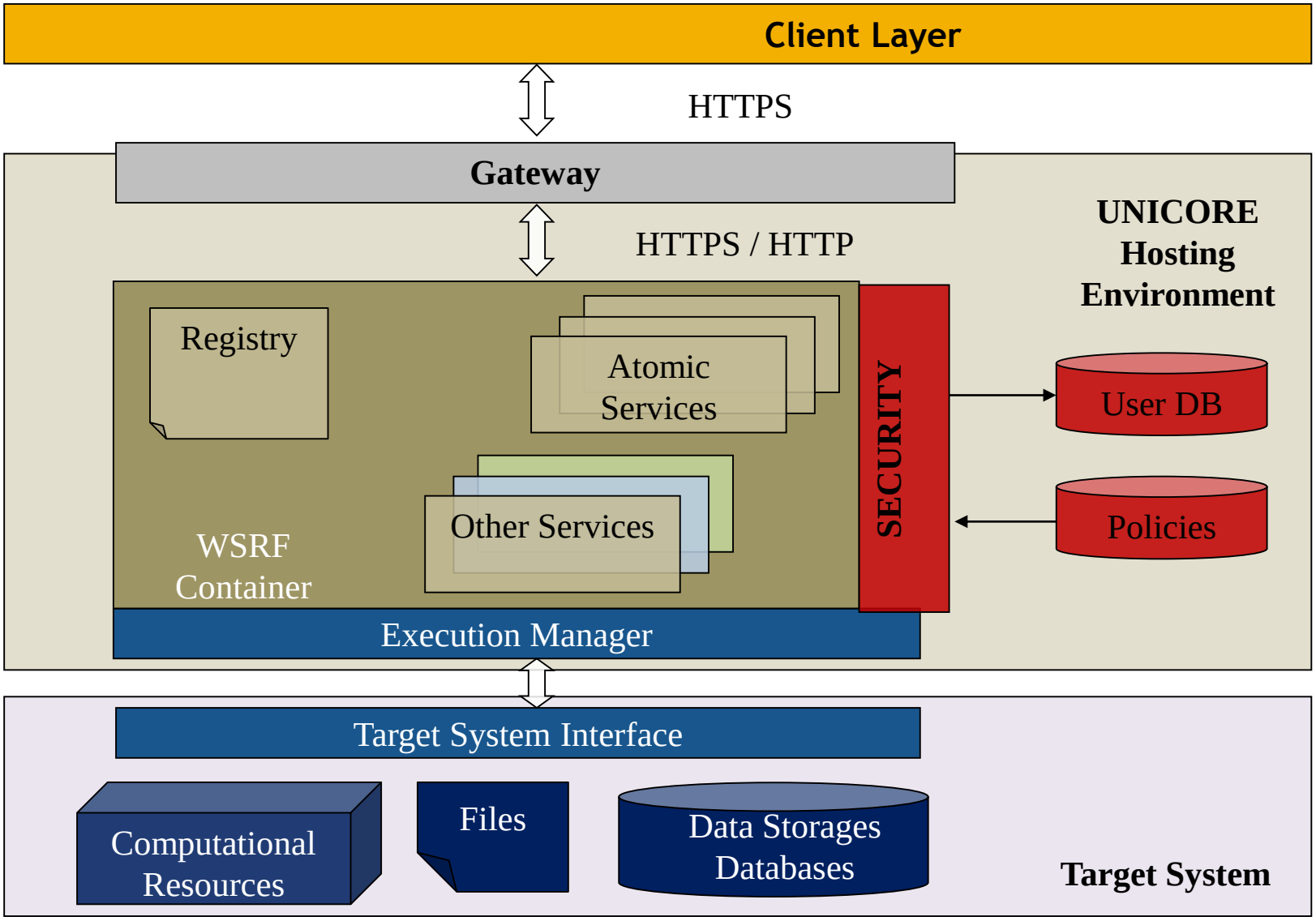
ICM

- HPC center providing computer resources to the Polish scientific community
  - More than 300 active grants
- Multiple HPC systems:
  - Cray XC40
  - Heterogenous PC cluster
    - Different types of processors
    - Some nodes equipped with GPU cards
  - IBM Power6
- Different access methods:
  - traditional (ssh)
  - grid type (via PL-Grid)

PL-Grid

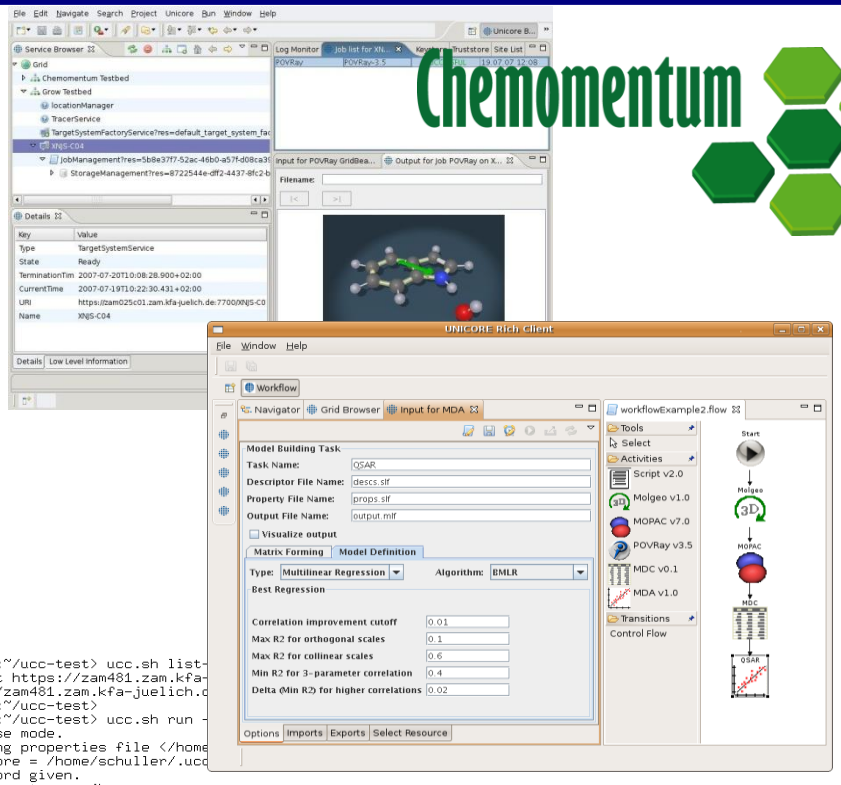
- National Grid Initiative
- Partners:
  - Polish supercomputer centres:
  - Cyfronet, ICM, PCSS, WCSS, TASK
- Project aims:
  - Build and operate Polish National Grid
  - Provide training and user's support
  - Provide support for application deployment on the grid
- ICM role in PL-GRID
  - Operate UNICORE access to the resources

UNICORE 7 Architecture



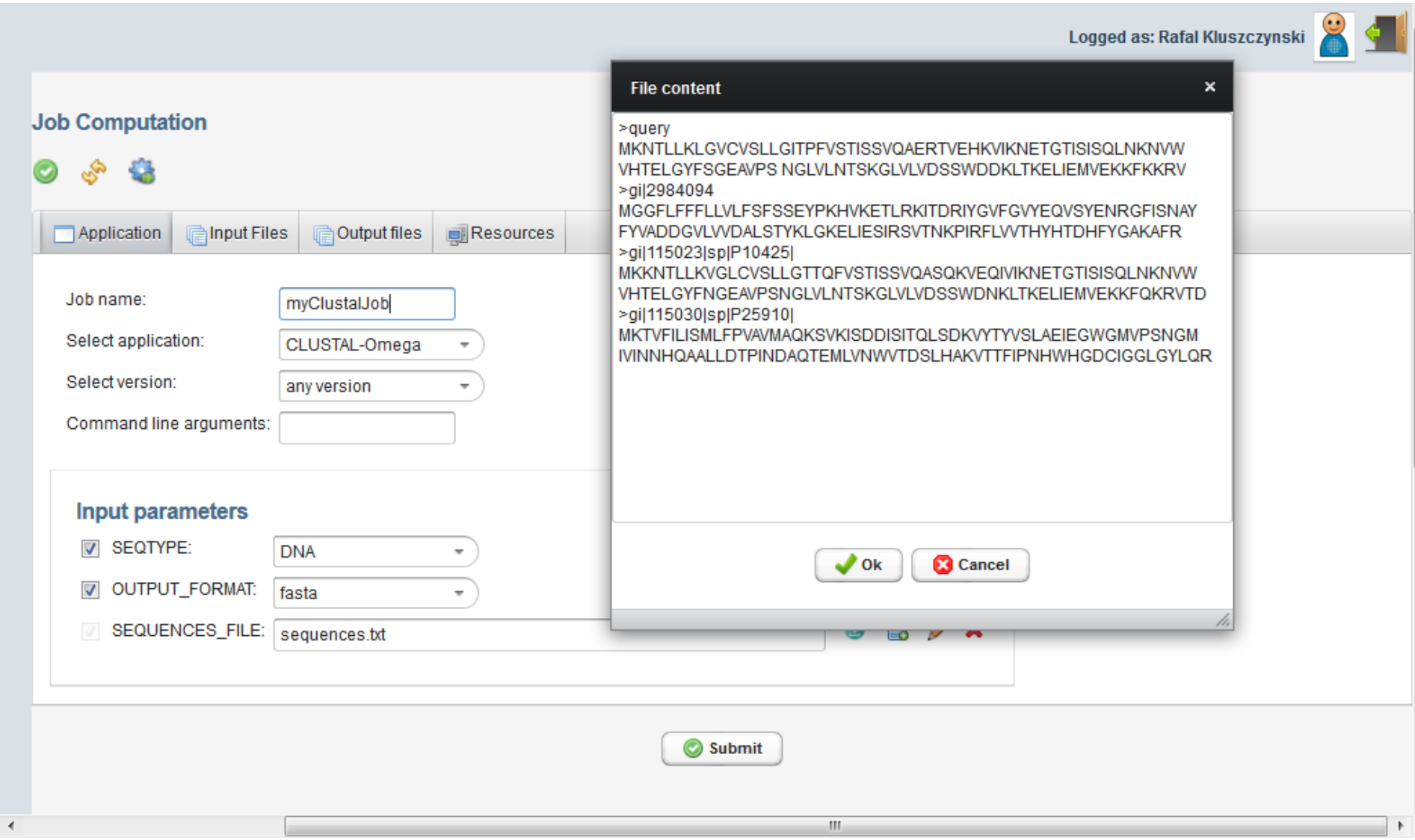
UNICORE Client framework

- Eclipse-based rich client
- Eclipse based workflow editor
- Command line client
- Web client
- UNICORE Portal

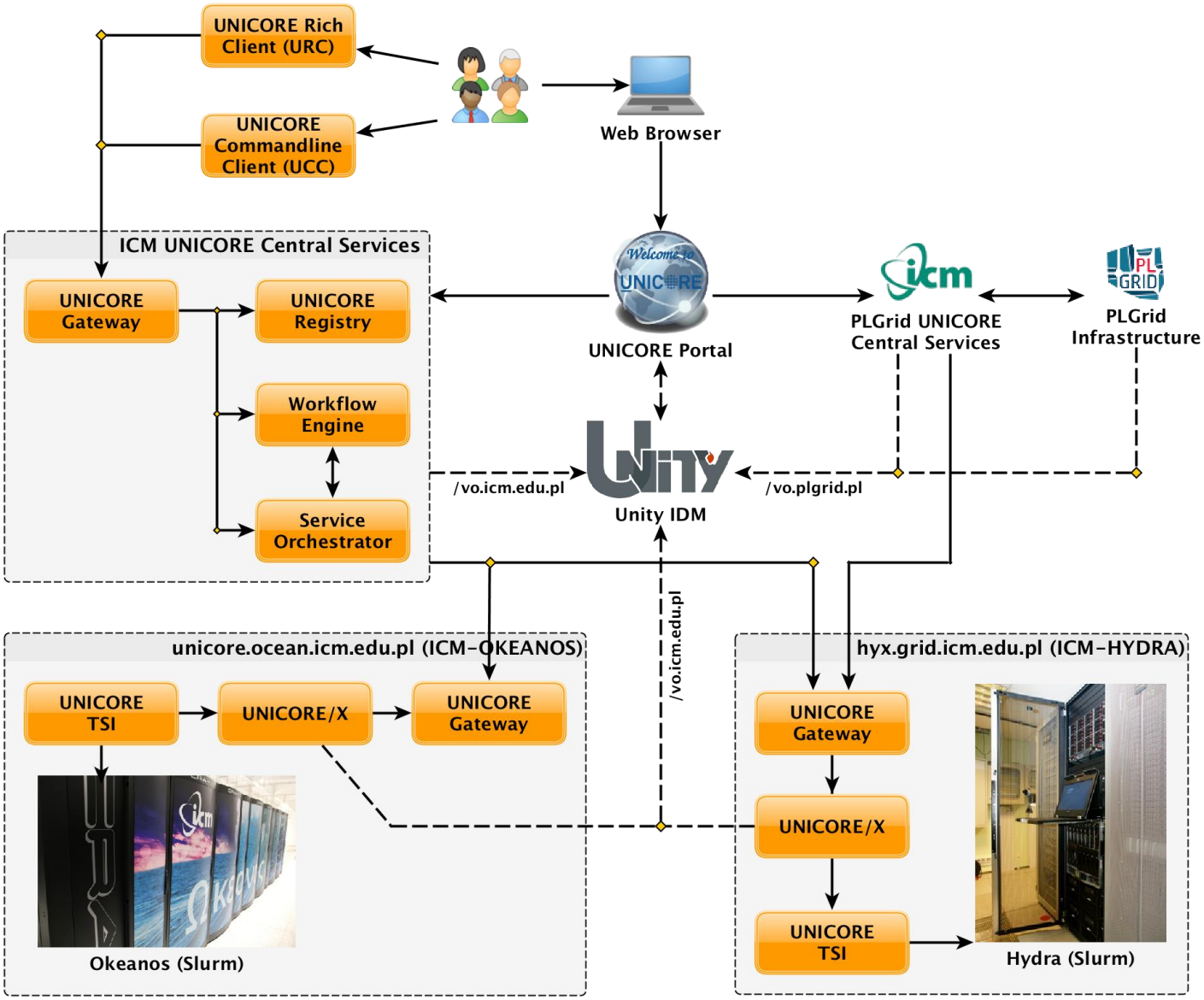



```
schuller@zam461:~/ucc-test> ucc.sh list-
Workflow_XNJS at https://zam481.zam.kfa-
XNJS at https://zam481.zam.kfa-juelich.d
schuller@zam461:~/ucc-test>
schuller@zam461:~/ucc-test> ucc.sh run -
[ucc run] Verbose mode.
[ucc run] Reading properties file </home
[ucc run] Keystore = /home/schuller/.ucc
[ucc run] Password given.
[ucc run] Keystore type = jks
[ucc run] Registry = https://zam481.zam.kfa-juelich.de:8080/XNJS/services/Registry?r
[ucc run] Pinging registry.
[ucc run] Registry PING OK, server reply: servertime=2007-05-31T16:40:05.858+02:00
[ucc run] Output goes to </tmp>
[ucc run] Synchronous processing = true
[ucc run] Read job from <date.u>
[ucc run] Found workflow tss, ignoring.
[ucc run] Selected TSS at https://zam481.zam.kfa-juelich.de:8080/XNJS/services/Targe
[ucc run] Job submitted, job url=https://zam481.zam.kfa-juelich.de:8080/XNJS/service
36bb500b5487
[ucc run] Job started.
[ucc run] Exporting USpace file 'stdout' to '/tmp/stdout'
/tmp/stdout
[ucc run] Exporting USpace file 'stderr' to '/tmp/stderr'
/tmp/stderr
[ucc run] Wrote job properties to /tmp/21e44764-5022-49f0-8ea2-86bb500b5487.properti
schuller@zam461:~/ucc-test> cat /tmp/stdout
Do Mai 31 16:40:09 CEST 2007
schuller@zam461:~/ucc-test>
```

UNICORE portal – Generic gridbean



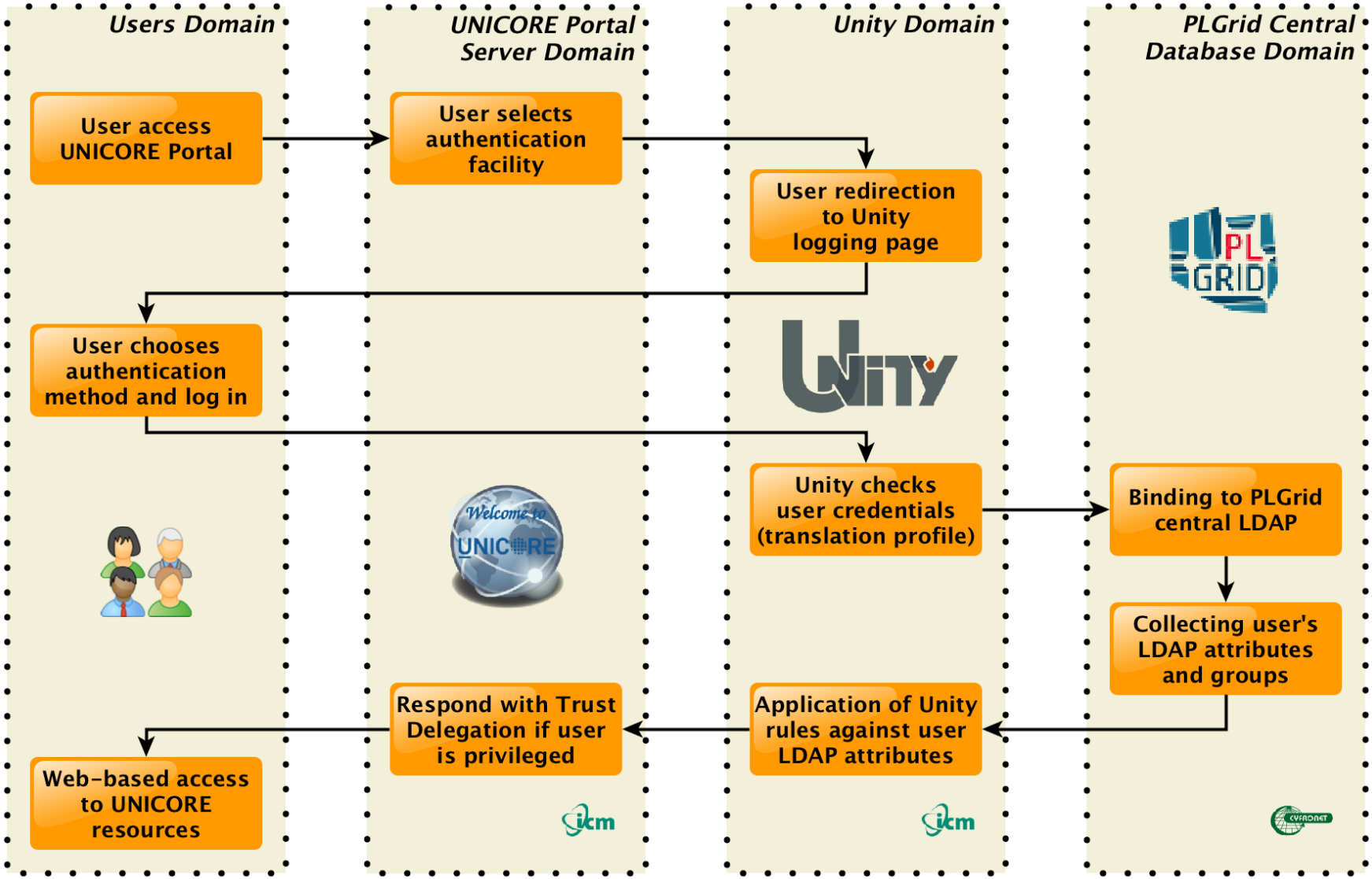
UNICORE infrastructure at ICM



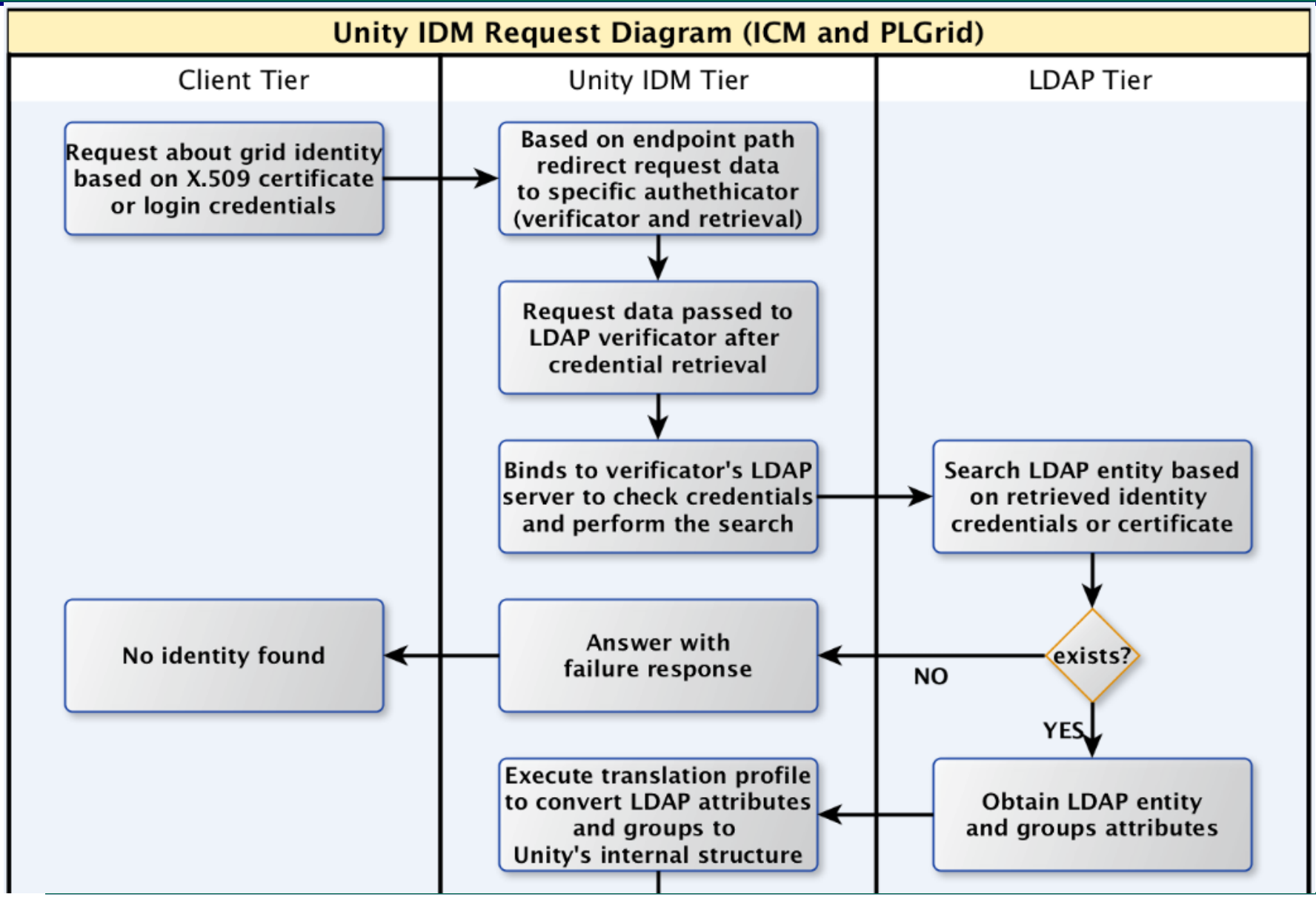
UNITY IDP

- Authentication
  - who is who
  - wide range of mechanisms & security levels
- Federations
  - where do they come from?
- Authorization levels
  - The relying system must be able to decide easily who has an access granted
- Privacy
  - from none to paranoid
- Identity management as a service
  - Could be used for grids and clouds

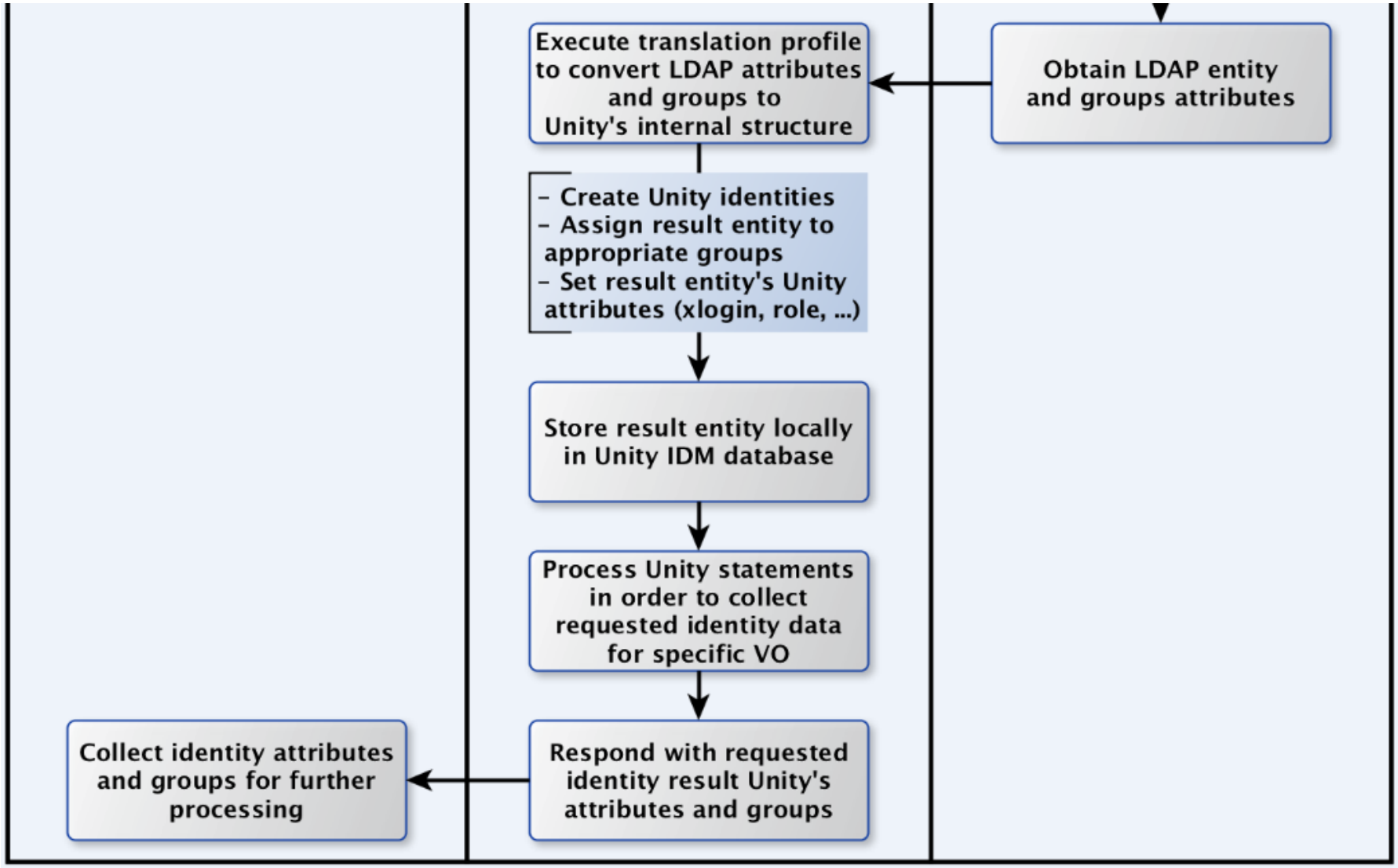
UNICORE – UNITY Integration



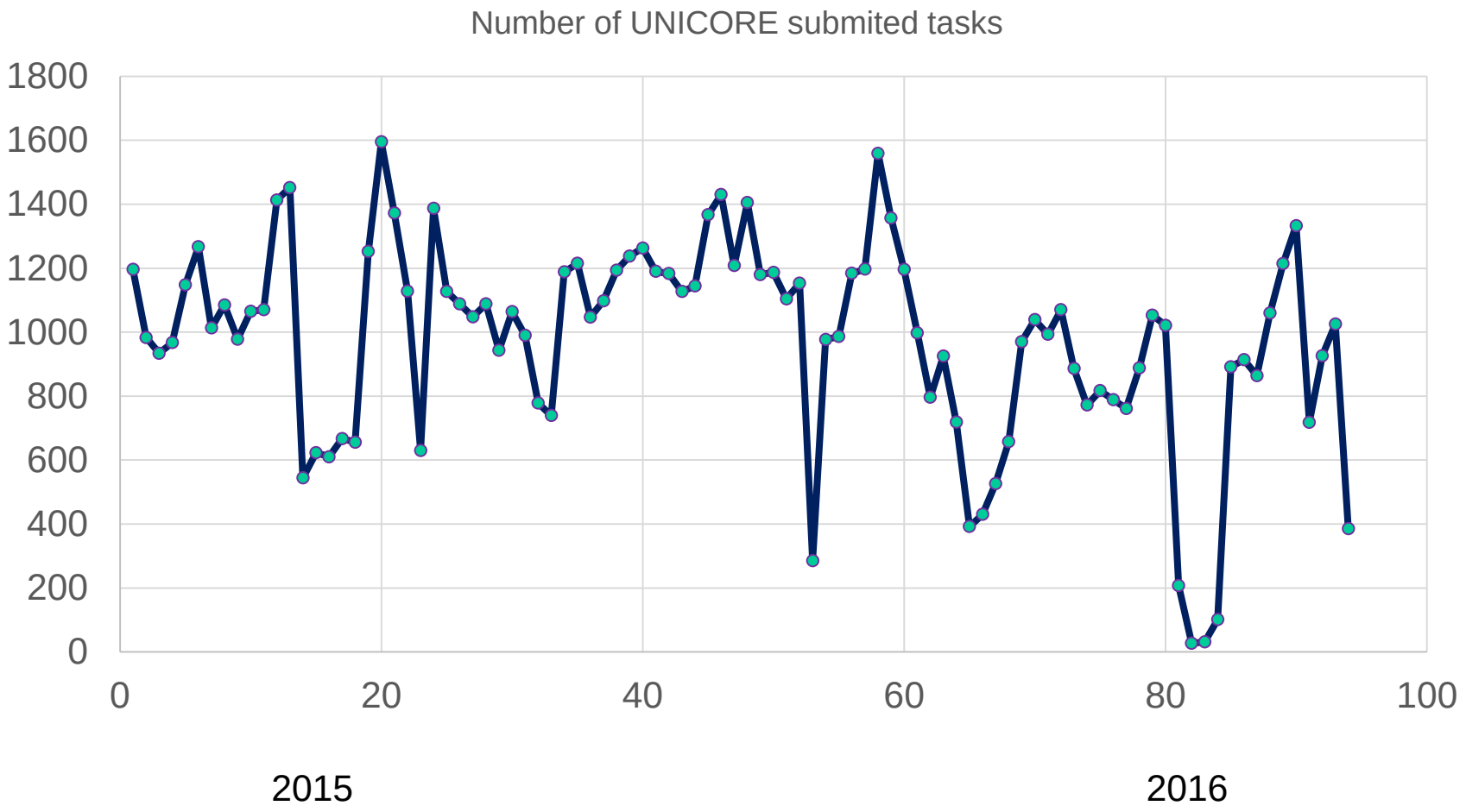
UNITY IDM request diagram (1)



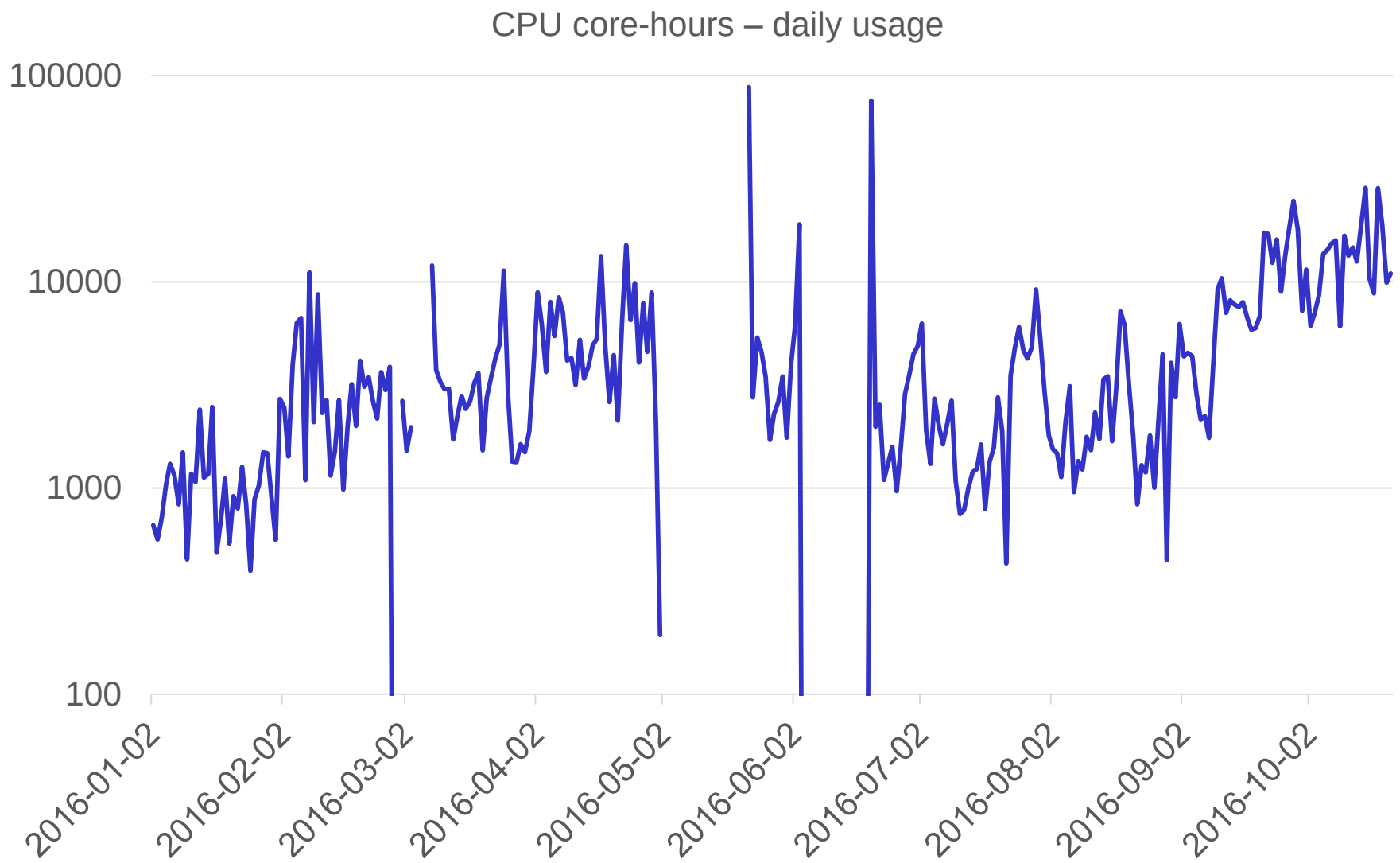
UNITY IDM request diagram (2)



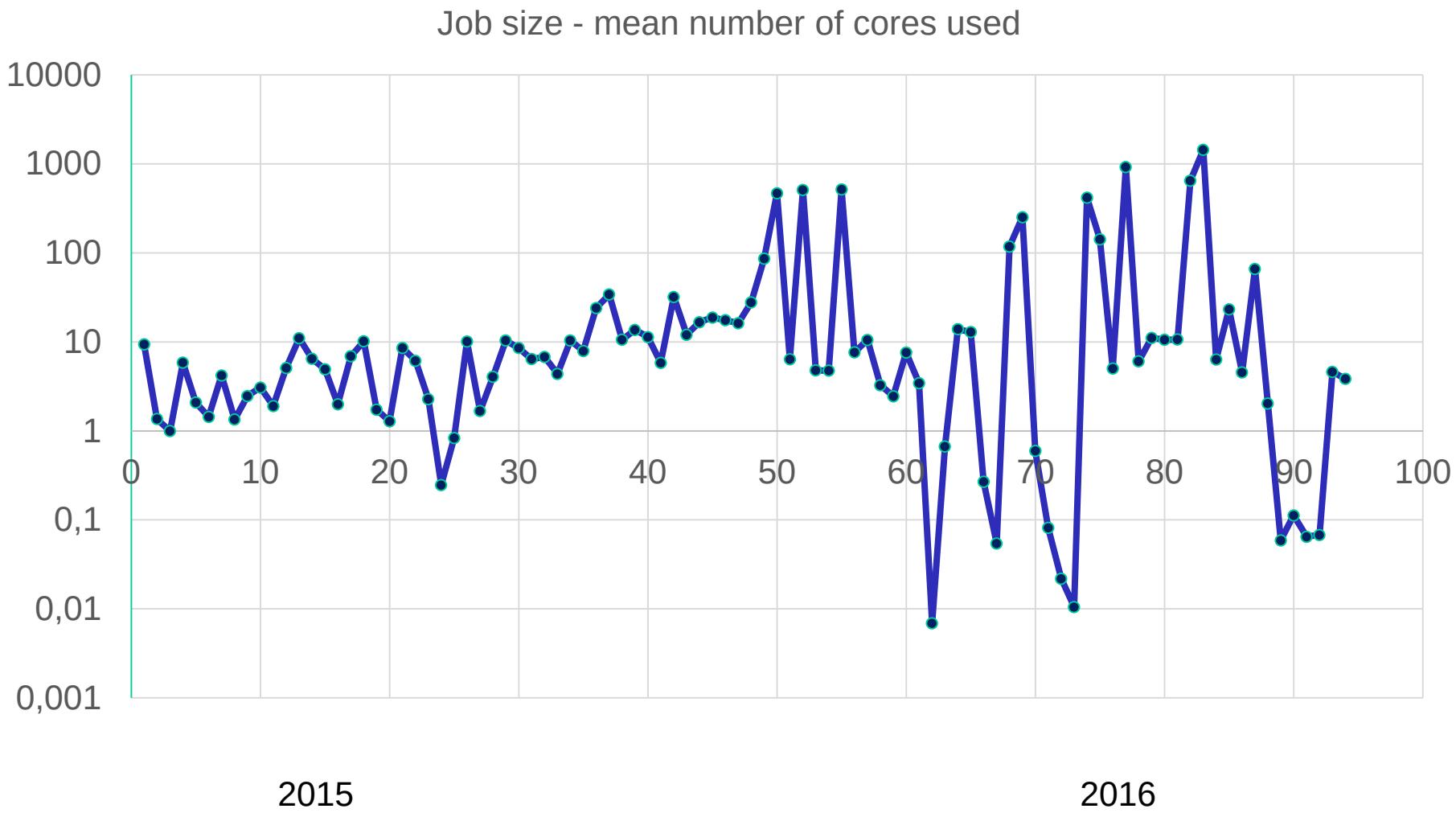
UNICORE usage



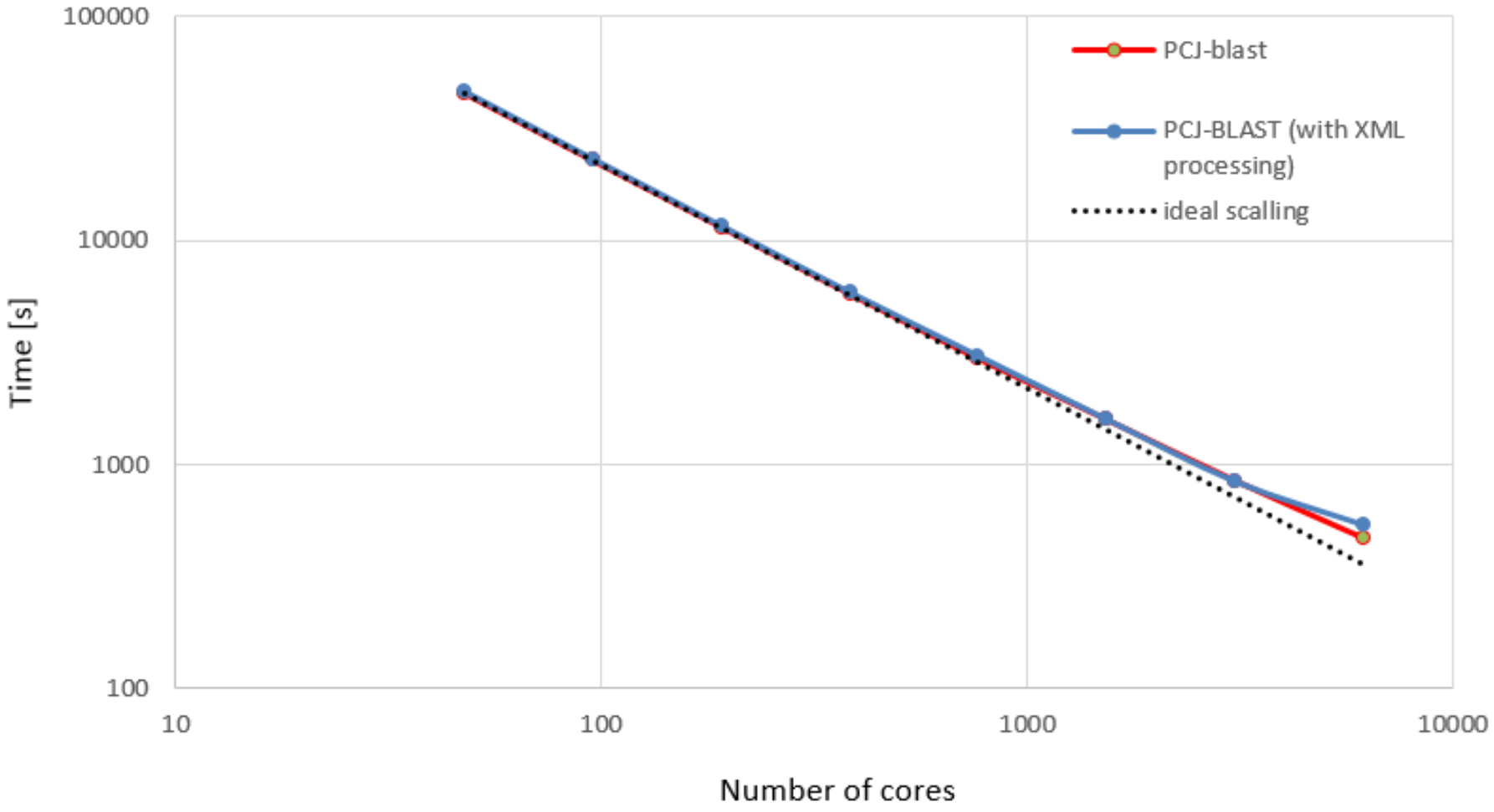
UNICORE usage (2006, daily)



UNICORE usage profile



#1 CPU usage: PCJ-Blast



http://pcj.icm.edu.pl

Conclusions

- Grid technology became mature enough to offer reliable, high-quality services designed to suit requirements of different scientific communities.
- UNICORE Portal offers web interface and automation of the processing of selected applications
- The users can focus on science instead of write complicated scripts, transferring the files and mastering complicated IT infrastructure.
- With the UNICORE Portal creation of the application and domain specific solution become simple and straightforward.
- The software stack necessary to build full-featured gateway is now small and easy to handle.

Acknowledgments

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