# EUFORIA

Bringing e-infrastructures to fusion community Achievements 2008-2010

Funded by EU Information Society and Media (INFSO)DG 2008-2010, aiming to bring Computational Science expertise and modern tools to Fusion Community.

Supporting fusion users

- **Providing infrastructure**
  - Grid (parallel and serial) and HPC infrastructures and support
    - EUFORIA and Fusion VO Grid infrastructure
    - HPC infrastructure for application (BSC, CSC, .EPCC)
    - DEISA/EGEE as production facilities
    - Pilot activity on cloud computing
- **Provide Application porting for selected codes to both Grid and HPC**
  - EFDA proposal: Focus on Edge and Core Turbulence and Transport
- **Provide Training**
  - Use of and adaptation of grid and HPC technologies
  - Direct Code adaptation for select codes and tools
  - Help to "self-help" – hands-on training for communities.
- **Provide extended toolkits for existing infrastructure**
  - Visualization , Workflow extensions Middleware developments
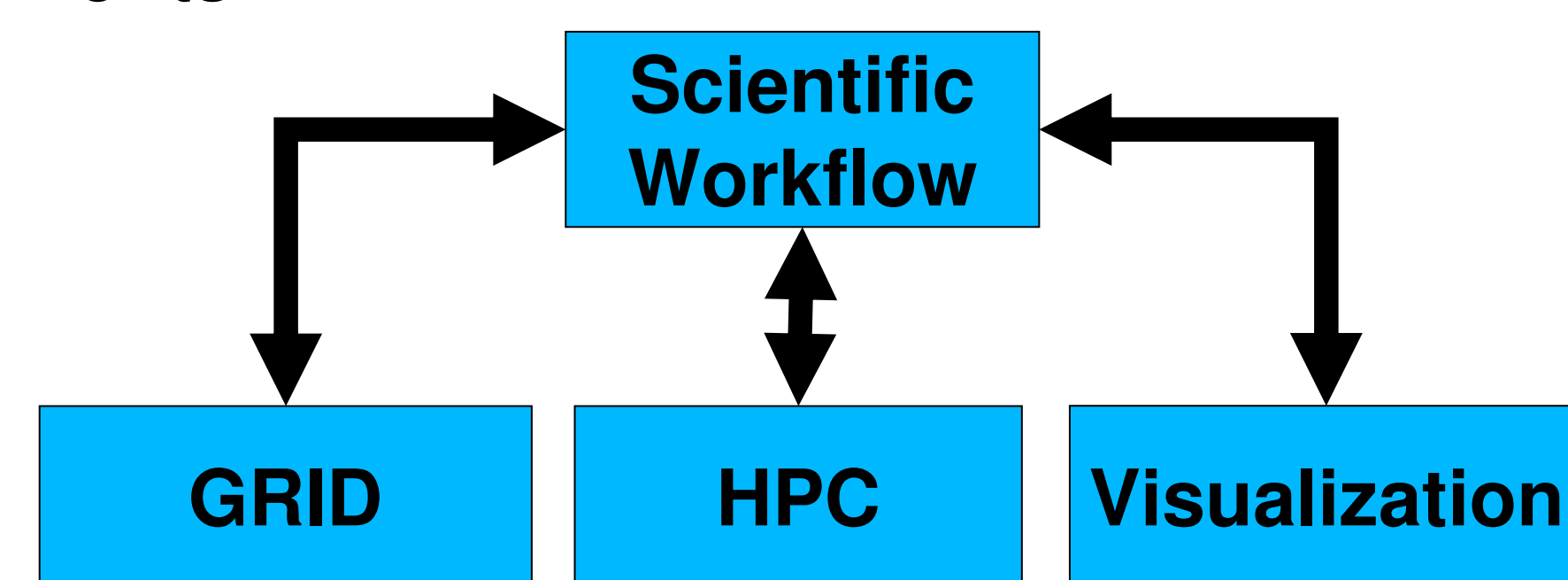
Transparent access to GRID (cloud) and HPC

HPC2K
GRID Actors
HPC Actors
Cloud Actors
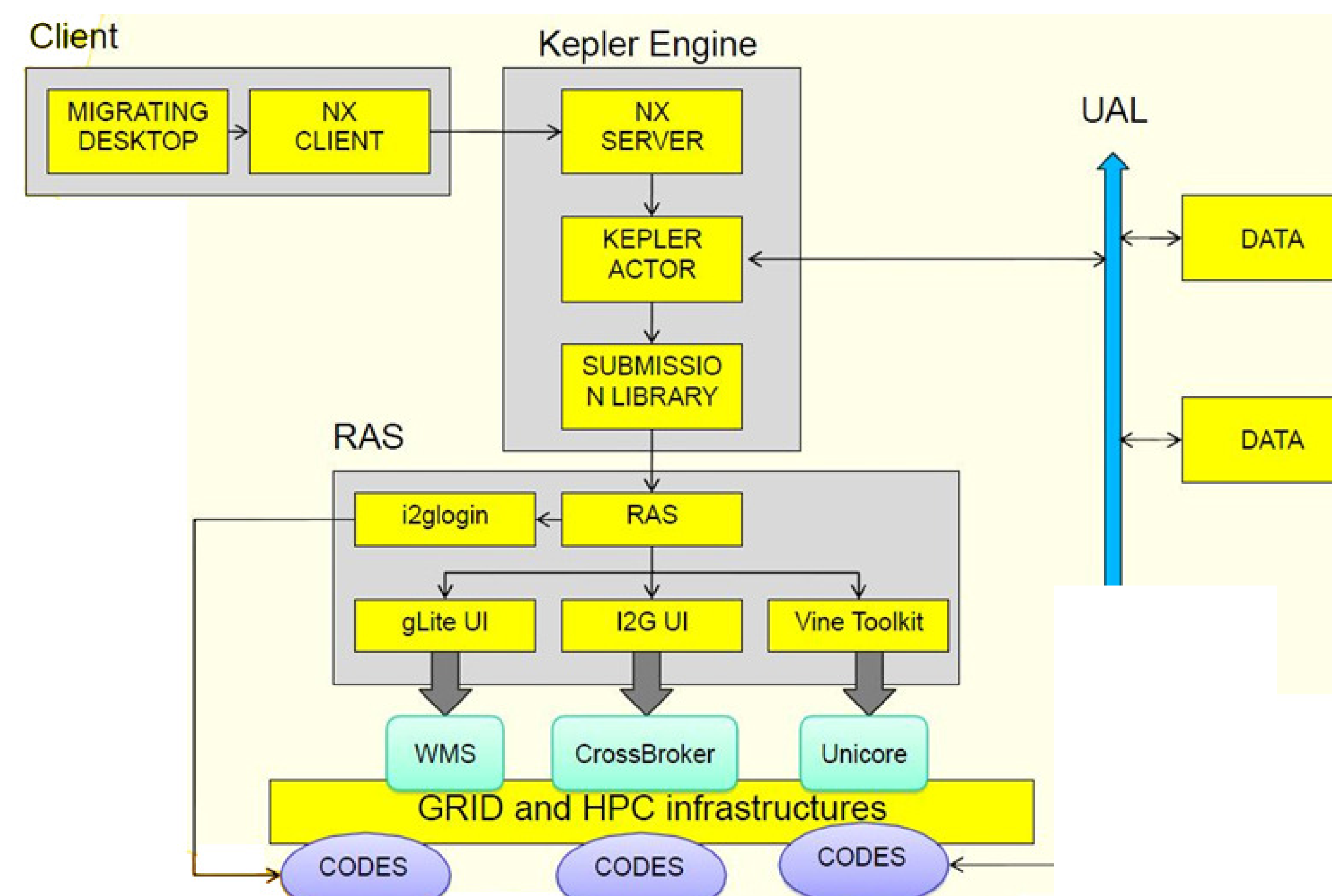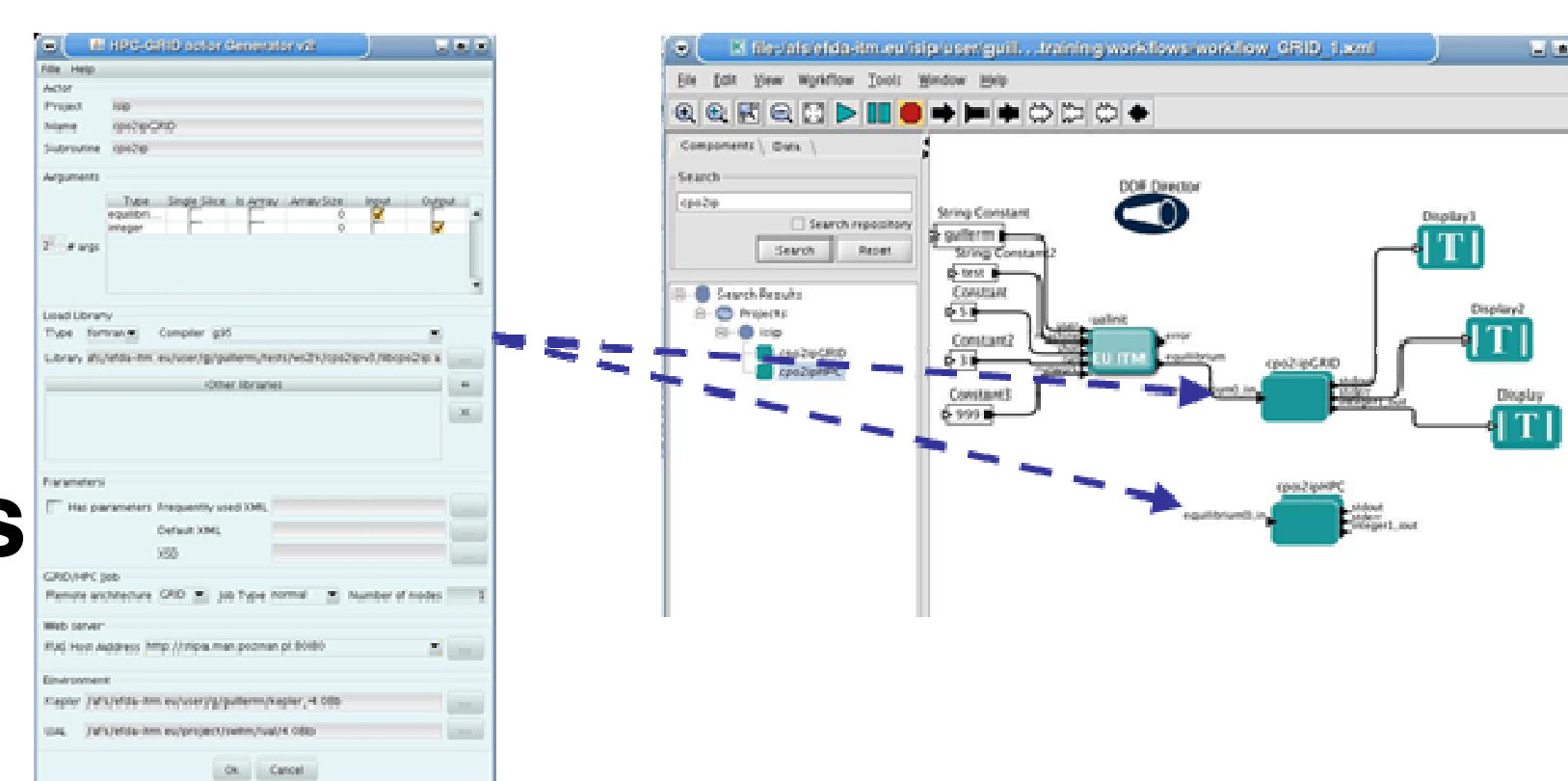
Optimization and porting

| Code	Initial scaling	Present scaling	Code-opt Speed-up
BIT1*	64-128	512-1024	20 % faster
CENTORI	128	128	Improved I/O functionality
EIRENE*	1024	1024	no speed up
ELMFIRE	512	2048	700%
ERO*	128	128	29% faster
ESEL	1	32	8 % faster
GEM*	128	512	275%
GENE	16384	16384	3% compu-ting, 400% for I/O
ISDEP*	1	1	42% faster
SOLPS	1	24	51% faster on 8 threads
TYR	128	2048	15% faster

*Also ported to grid with DAB, ILSA-Helena,VMEC. Links HPC-FF HLST
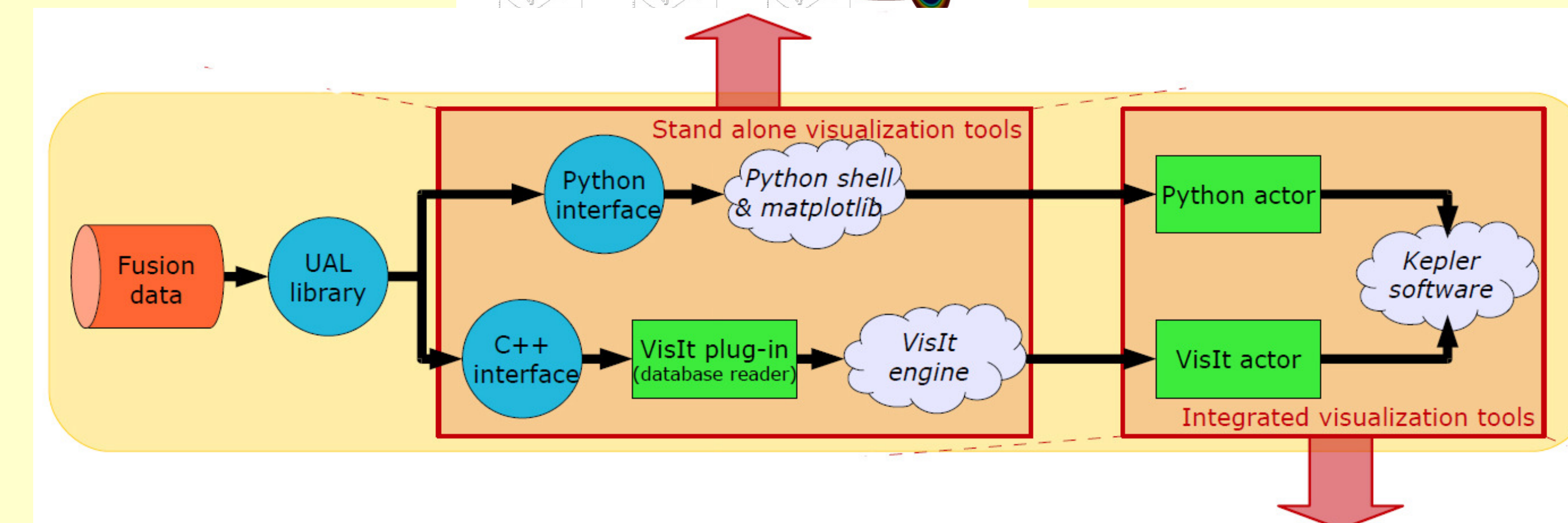
Training

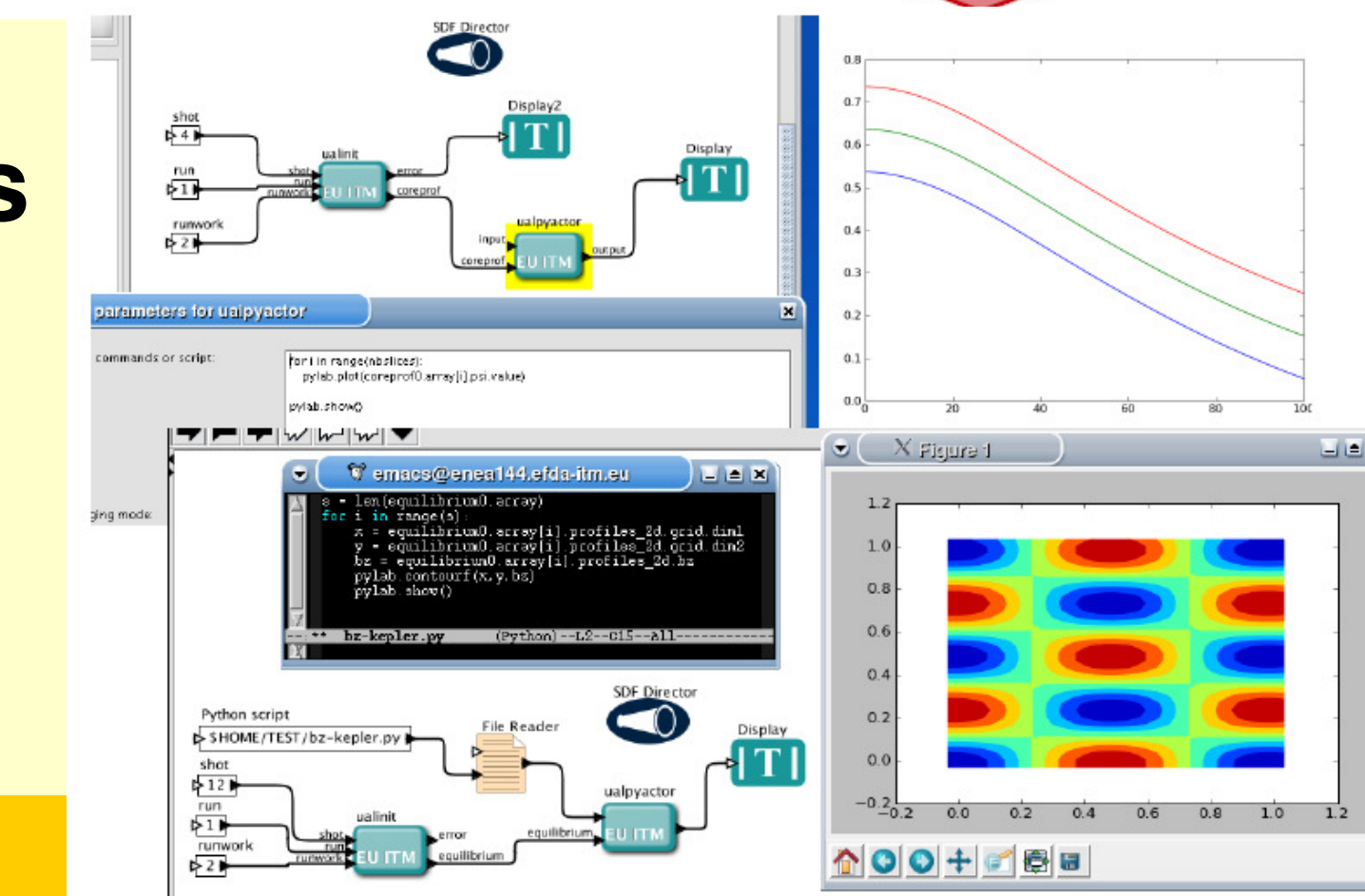**EUFORIA has provided much of the training to the fusion community (Target communities: ITM-TF and GOTiT)**

Visualization
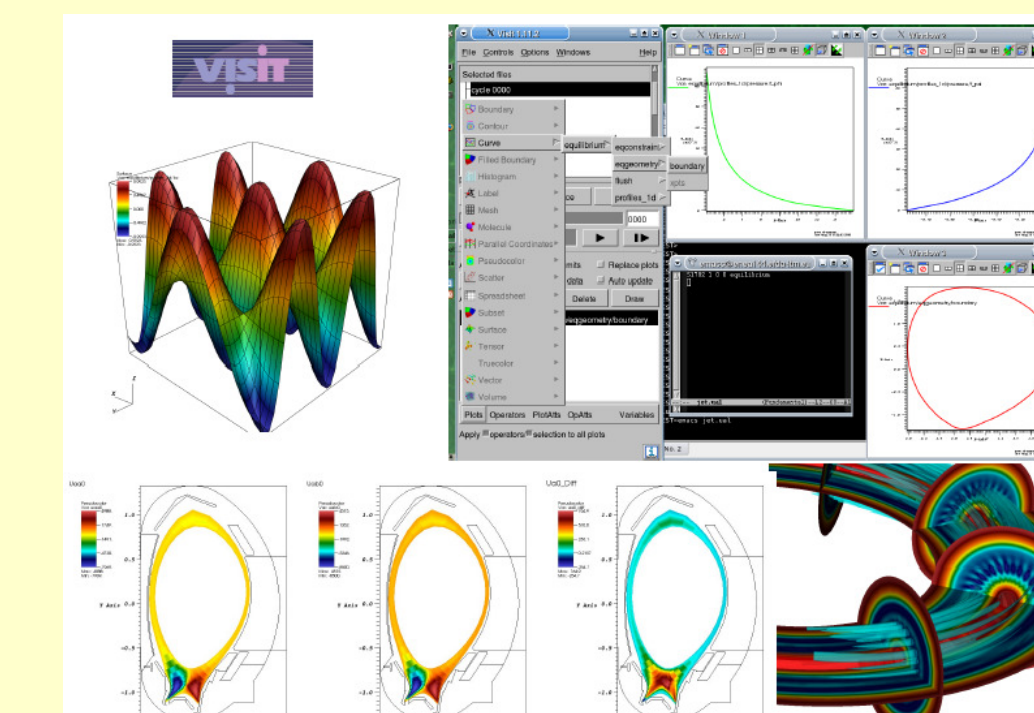
Standalone tools
- Visit
- Python/Mathplotlib
- UAL aware

Integrated actors tools
- Visit
- Python/Mathplotlib

Impact

- ✓ 550 training days provided
- ✓ More than 50 publications
- ✓ 10 million HPC hours provided
- ✓ Complex workflows established across a range of application scenarios/types (Grid serial, Grid parallel, parameter scan, HPC, …)
- ✓ Significant parallel performance improvement in high impact fusion codes
- ✓ Workflows providing transparent access to Grid, HPC, and Cloud resources - Including EGEE-EUFORIA-DEISA pilot project
- ✓ Satisfied user community
- ✓ Extensive uptake in fusion community of EUFORIA developed tools for visualisation and distributed computing access

http://www.euforia-project.eu/EUFORIA/