

Connecting Clusters

The Grid Idea



SWITCH

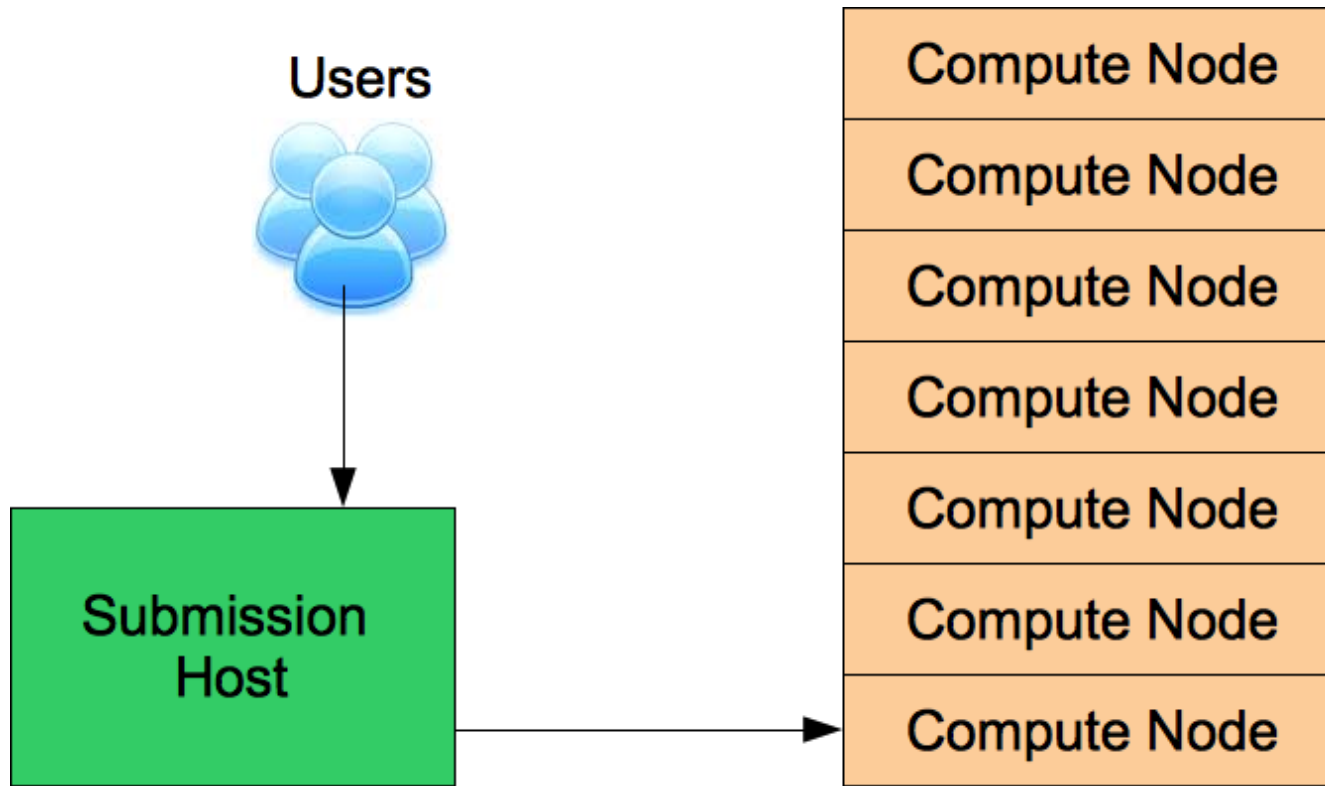
Serving Swiss Universities

Andres Aeschlimann

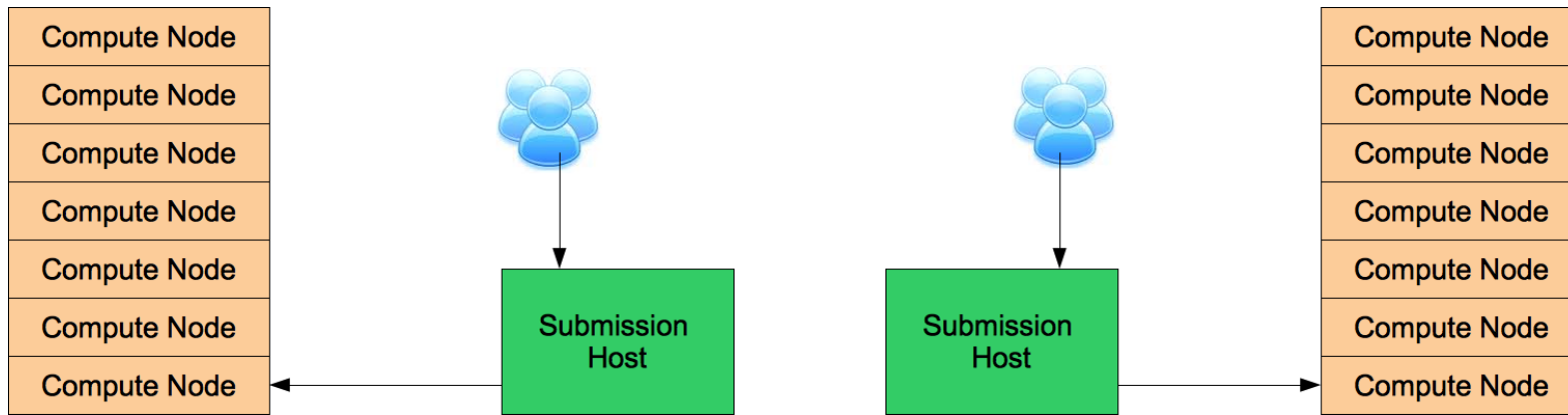
andres.aeschlimann@switch.ch

Villigen, 18. May 2011

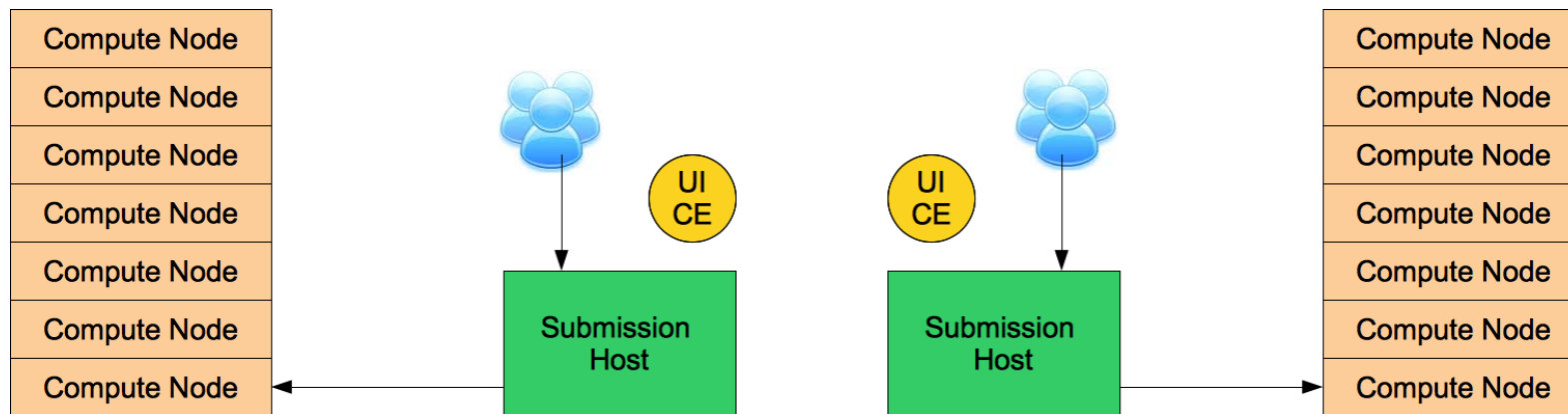
Initial situation



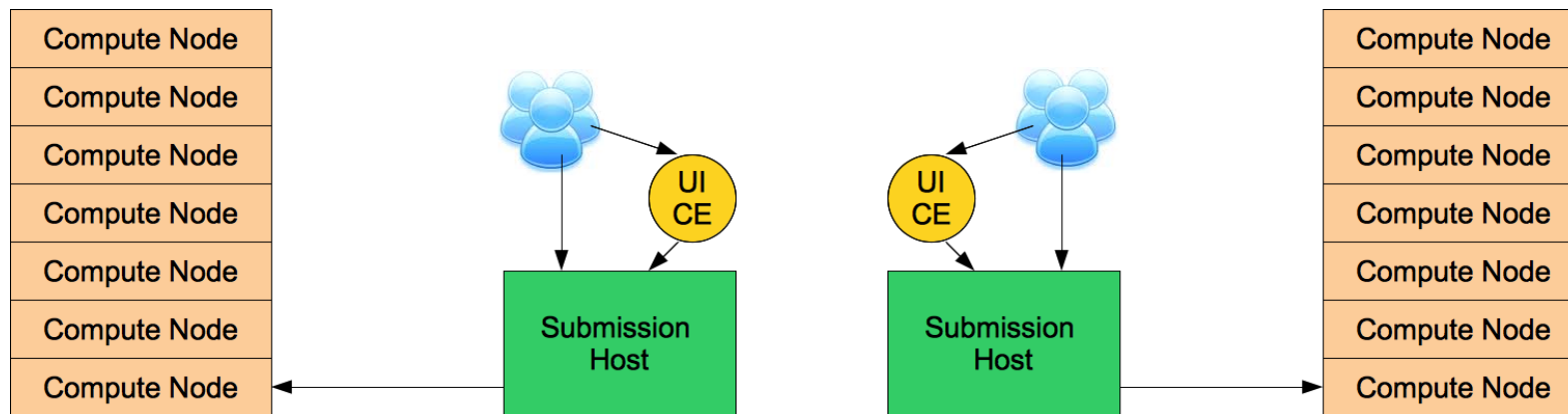
Looking at your colleagues



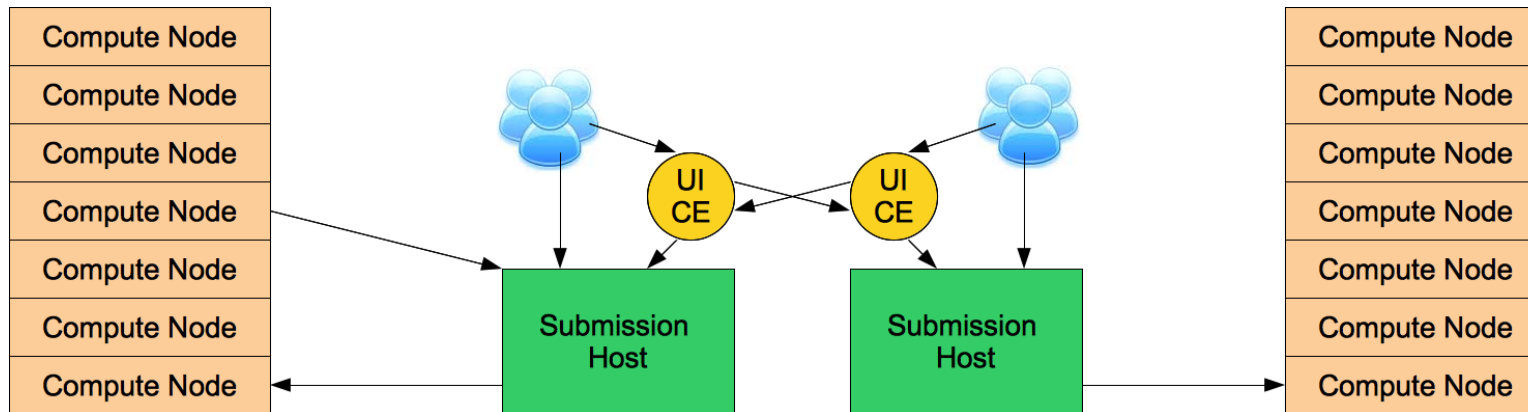
Bridging the gap



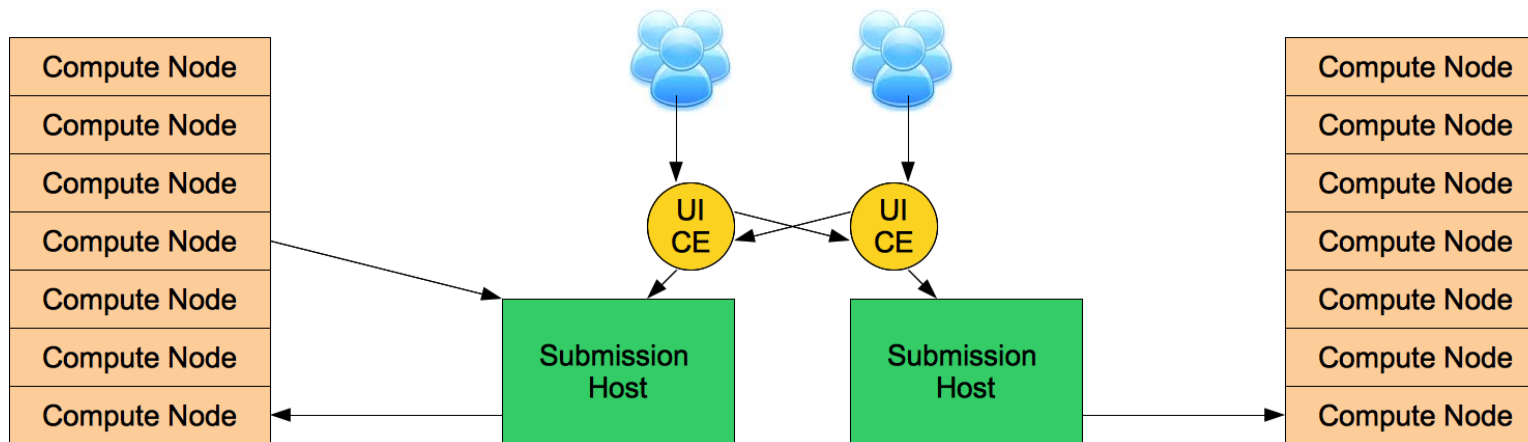
Bridging the gap (cont.)



Putting it together



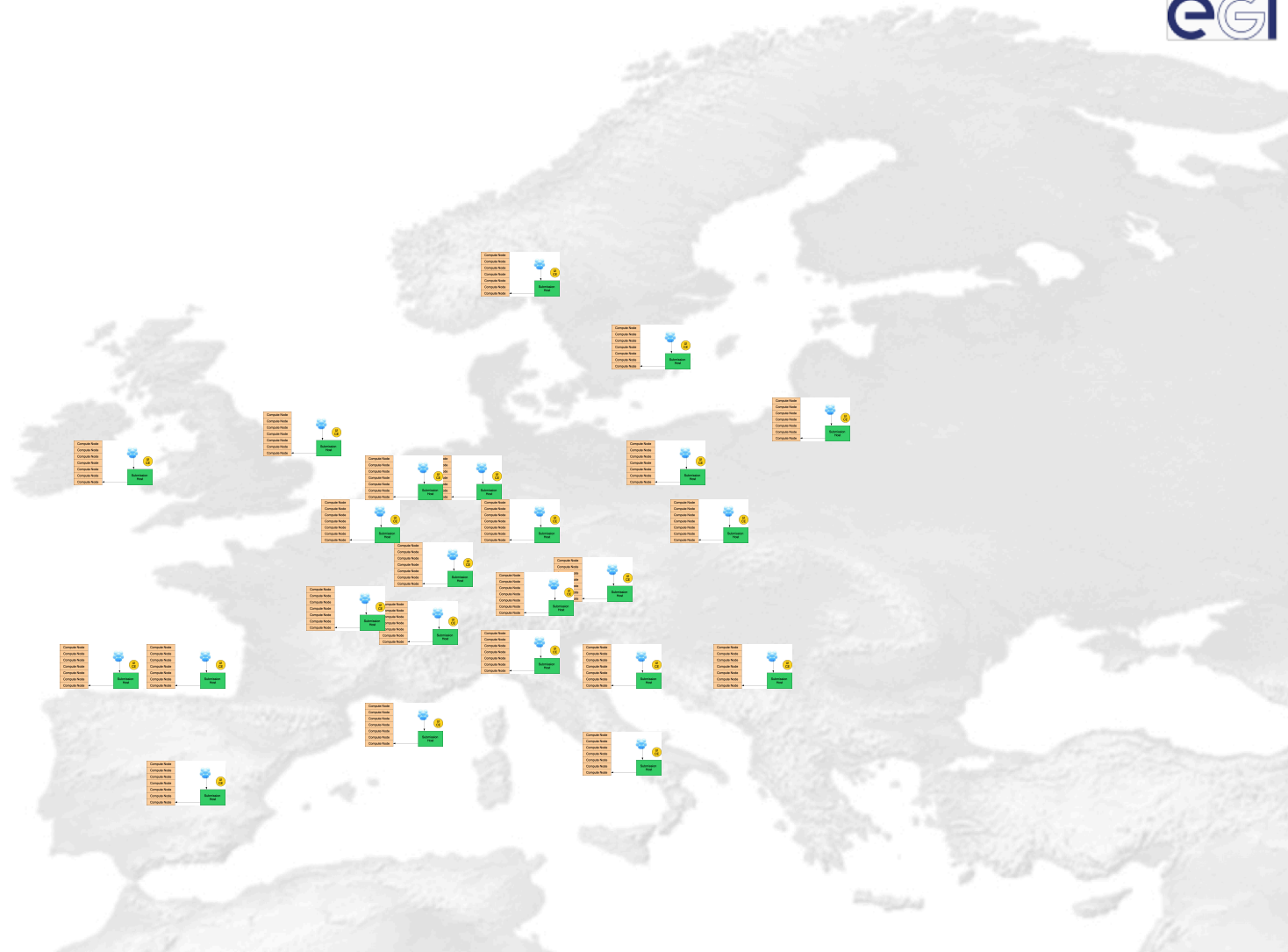
Option: all users go through the Grid



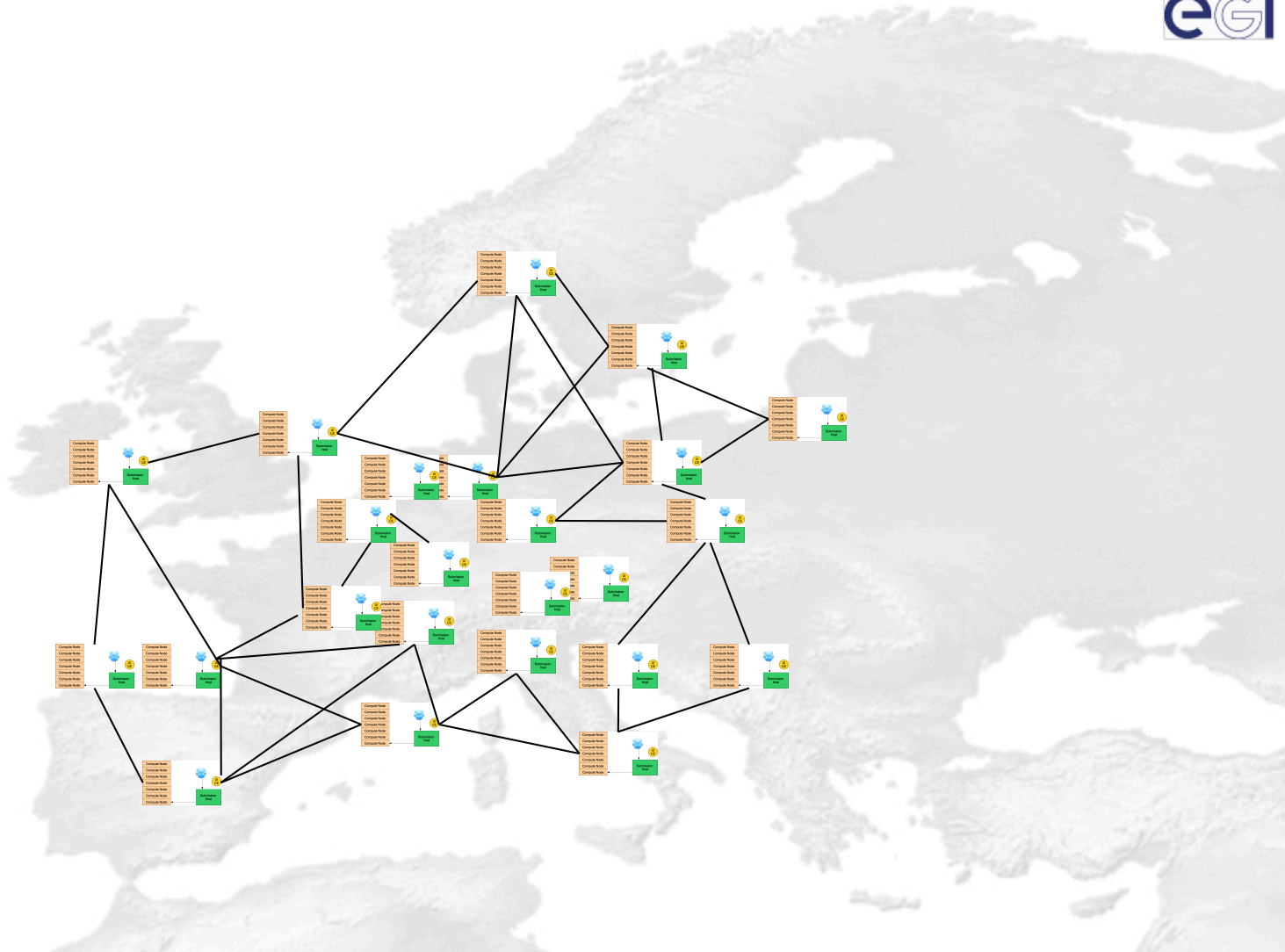
Grid Oversight: European view



Grid Oversight: European view



Grid Oversight: European view



Grid at Work

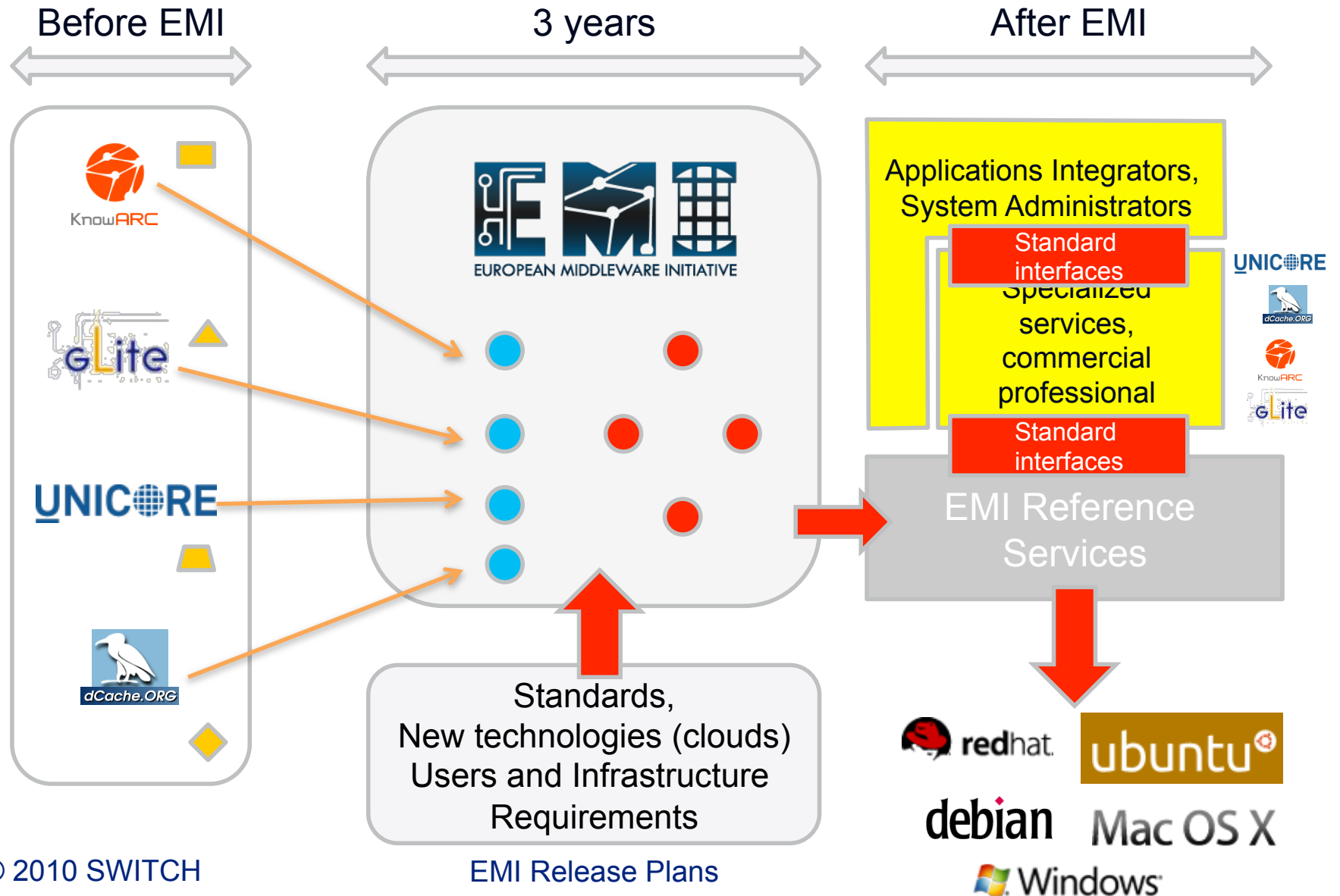
Film

Few years ago



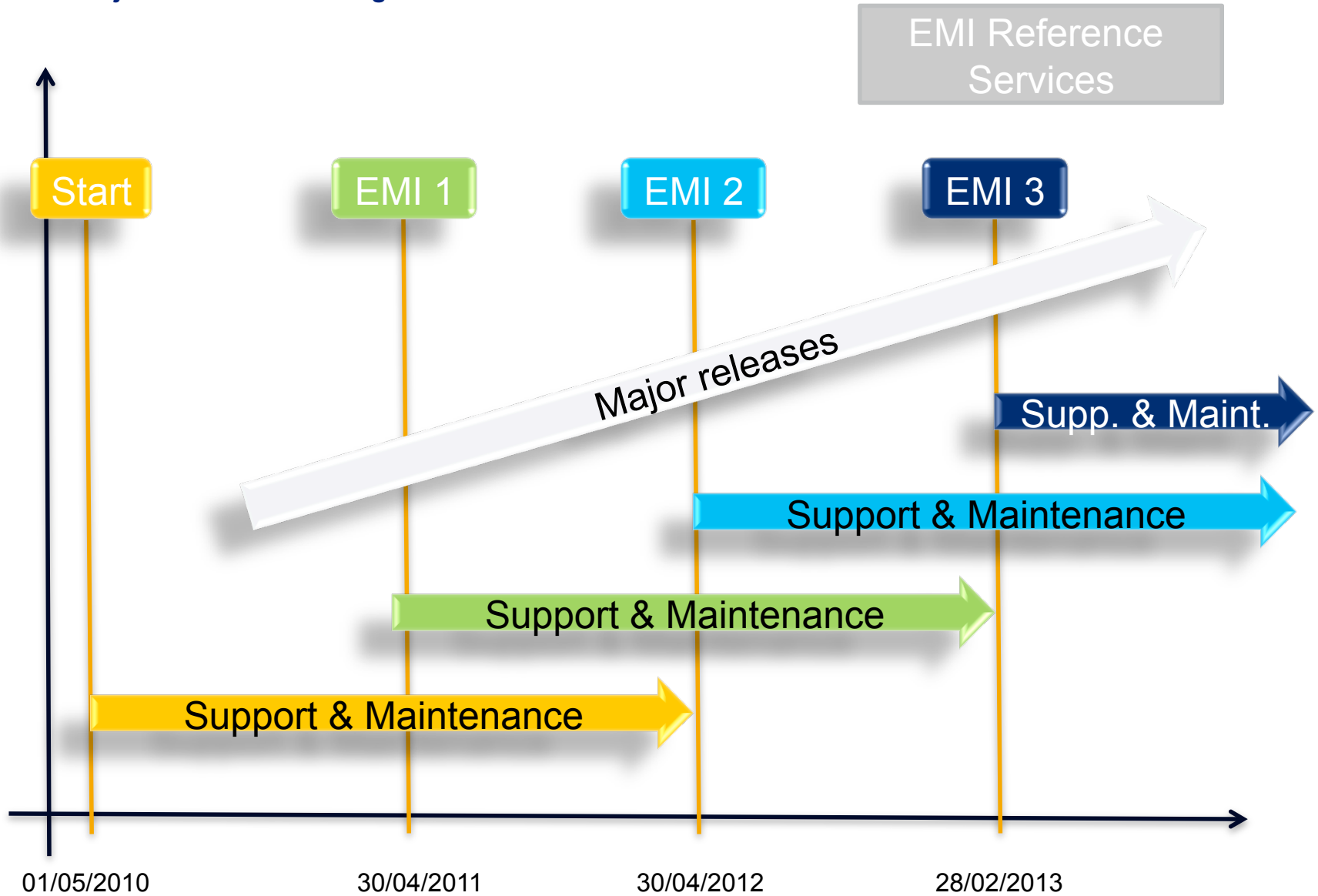
EMI Middleware Evolution

Courtesy of EMI Project Director A. Di Meglio

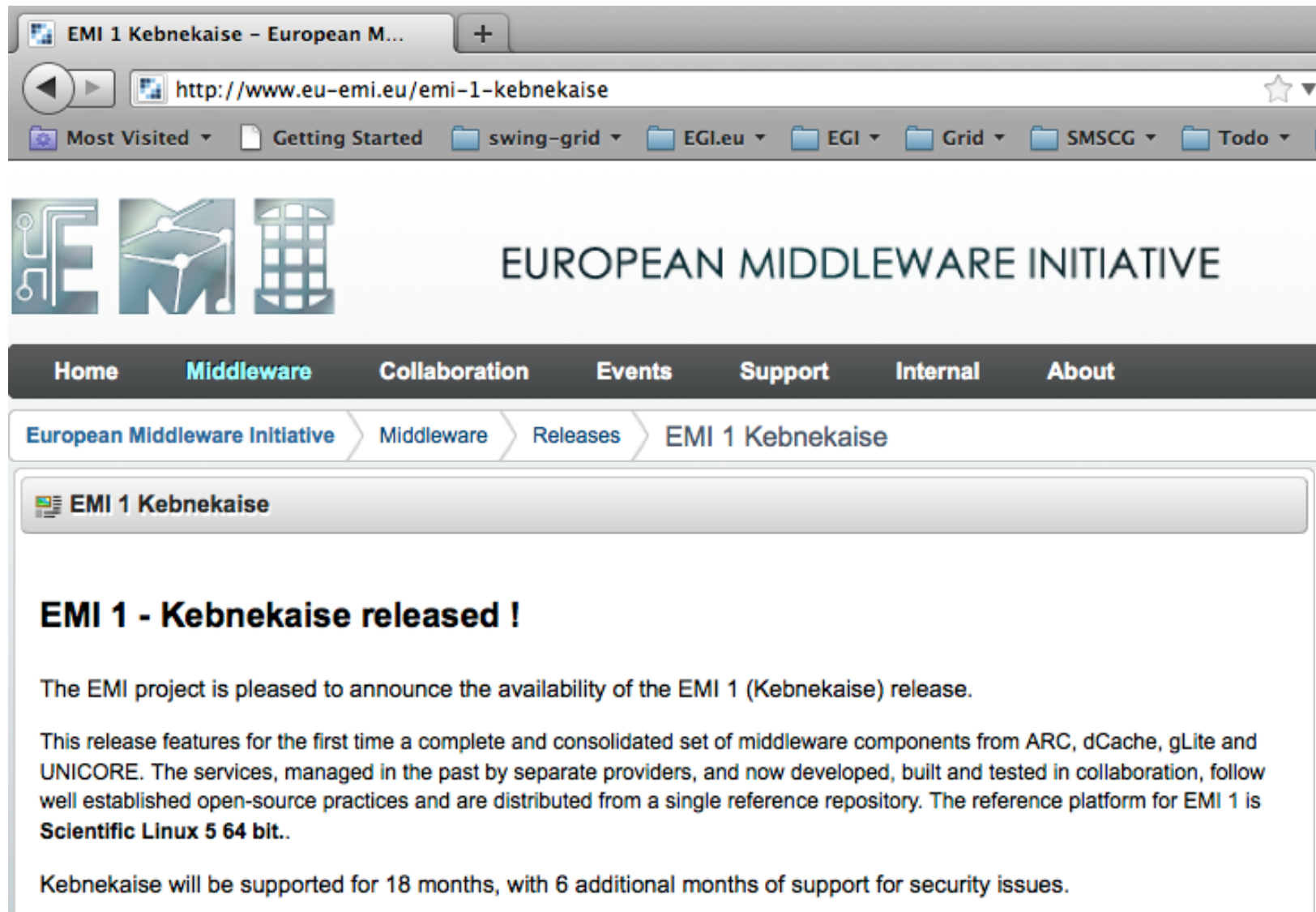


Release Plan

Courtesy of EMI Project Director A. Di Meglio



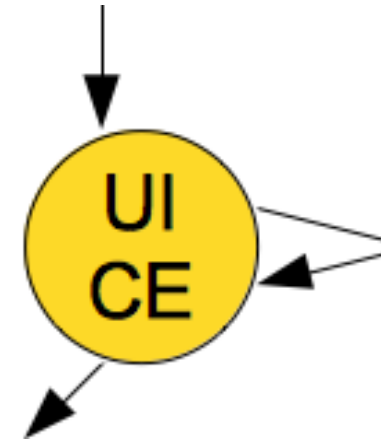
12.5.2011: EMI – 1 Kebnekaise released



The screenshot shows a web browser window with the address bar displaying <http://www.eu-emi.eu/emi-1-kebnekaise>. The browser's bookmark bar includes 'Most Visited', 'Getting Started', 'swing-grid', 'EGI.eu', 'EGI', 'Grid', 'SMSCG', and 'Todo'. The page header features the EMI logo (three stylized icons: a circuit, a cube, and a grid) and the text 'EUROPEAN MIDDLEWARE INITIATIVE'. A navigation menu contains 'Home', 'Middleware', 'Collaboration', 'Events', 'Support', 'Internal', and 'About'. Below the menu is a breadcrumb trail: 'European Middleware Initiative > Middleware > Releases > EMI 1 Kebnekaise'. The main content area has a sub-header 'EMI 1 Kebnekaise' and a bold heading 'EMI 1 - Kebnekaise released !'. The text below reads: 'The EMI project is pleased to announce the availability of the EMI 1 (Kebnekaise) release. This release features for the first time a complete and consolidated set of middleware components from ARC, dCache, gLite and UNICORE. The services, managed in the past by separate providers, and now developed, built and tested in collaboration, follow well established open-source practices and are distributed from a single reference repository. The reference platform for EMI 1 is Scientific Linux 5 64 bit.. Kebnekaise will be supported for 18 months, with 6 additional months of support for security issues.'

A closer look:

- UI: user interface
- CE: compute element
- Information system: GIIS or BDII
- Data management
- Monitoring
- Accounting
- VOMS
- ...



Integration point into LRMS:

```
/emi-path/libexec$ ls -l submit-*  
-rwxr-xr-x 1 root root 18014 2010-12-22 00:00 submit-condor-job*  
-rwxr-xr-x 1 root root 7415 2010-12-22 00:00 submit-fork-job*  
-rwxr-xr-x 1 root root 11747 2010-12-22 00:00 submit-ll-job*  
-rwxr-xr-x 1 root root 13546 2010-12-22 00:00 submit-lsf-job*  
-rwxr-xr-x 1 root root 16647 2010-12-22 00:00 submit-pbs-job*  
-rwxr-xr-x 1 root root 13478 2010-12-22 00:00 submit-sge-job*  
-rwxr-xr-x 1 root root 15413 2010-12-22 00:00 submit-SLURM-job*
```

```
SGE_QSUB='qsub -S /bin/sh'  
...  
build up LRMS_JOB_SCRIPT  
...  
${SGE_QSUB} < $LRMS_JOB_SCRIPT ...  
...
```

Egi InSPIRE: Numbers



- 330 resource centers in 58 countries
- 200'000 cores (InSPIRE)
- (+100'000 cores worldwide)
- 100PB disk capacity
- MPI enabled RC's: ~25%
- 933'000 jobs/day (55'000 non-HEP)
- 13'000 users (45% HEP)
- 186 VO's
- average availability and reliability: ~91% (project target 90%)
- overall utilization ~70%

Grid Oversight: Swiss view and SMSCG

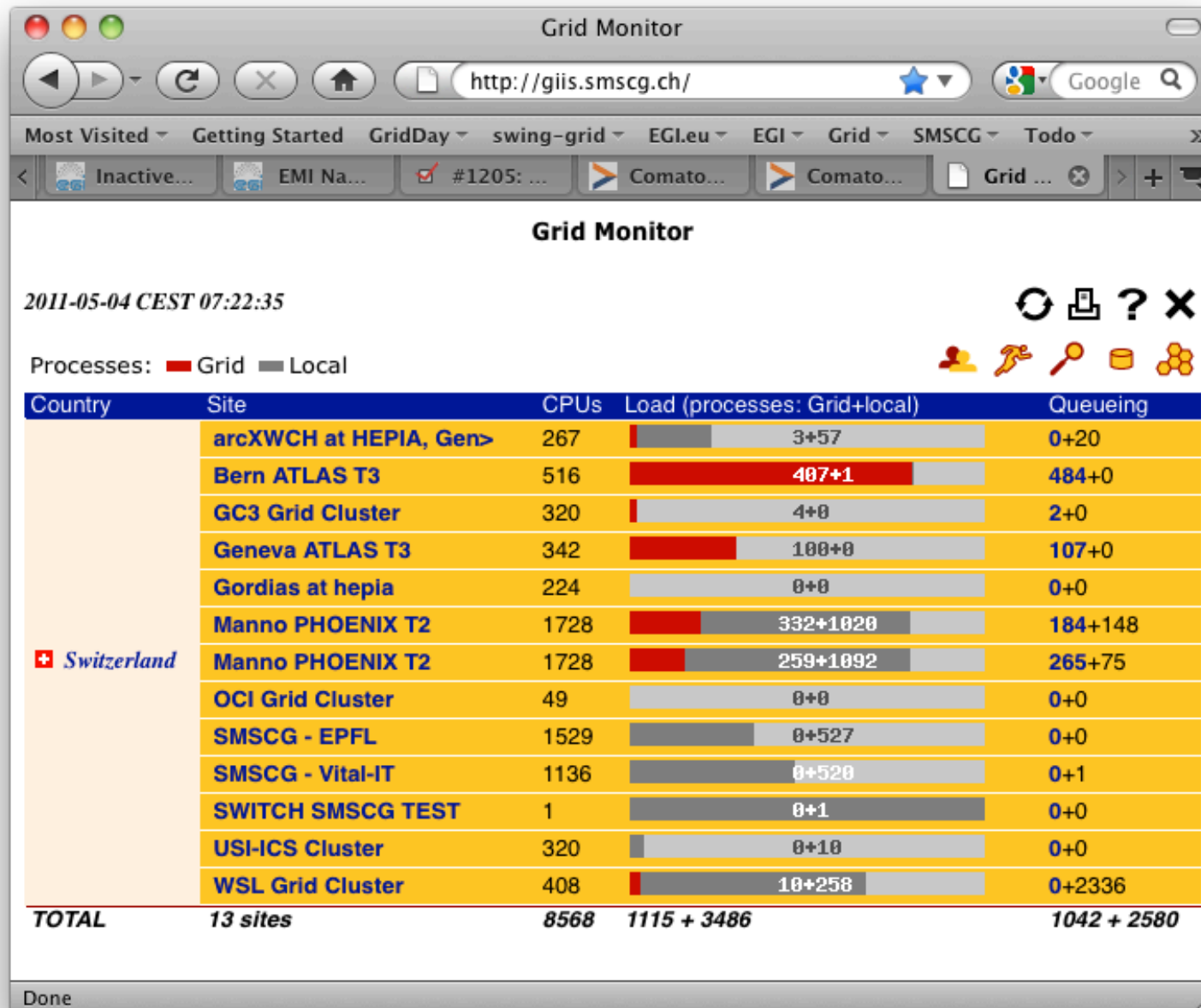


Numbers in CH:

- 12 sites in 1 country (9 partners)
- 7'000 cores
- 3'000 jobs/day +/- 10'000 walltime hours/day
- 3 VO's (life, earth, HEP)
- 8 applications (6 life science, 1 earth, 1 HEP)



Grid Oversight: Swiss view



References:

<http://www.swing-grid.ch/>

<http://www.eu-emi.eu/>

<http://www.egi.eu/projects/egi-inspire/index.html>

<http://www.smscg.ch/>



European Grid **Infrastructure**

Towards a sustainable grid infrastructure

Thank you