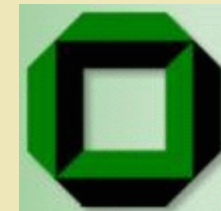


CMS Software Installation

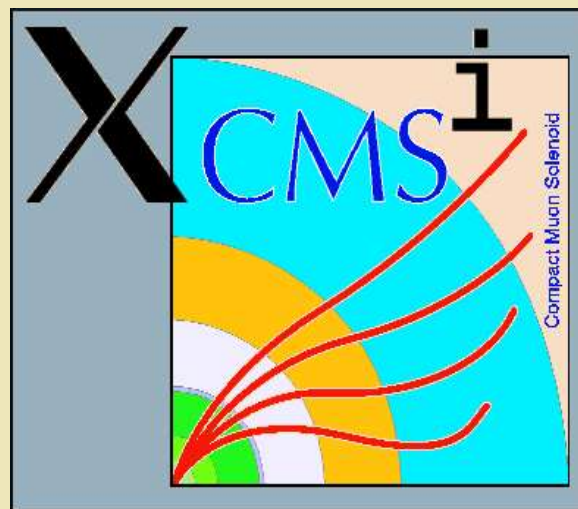


Klaus Rabbertz
Universität Karlsruhe

Andreas Nowack



Shahzad Muzaffar



Andrea Sciabà



Joanna Weng



Marco Corvo



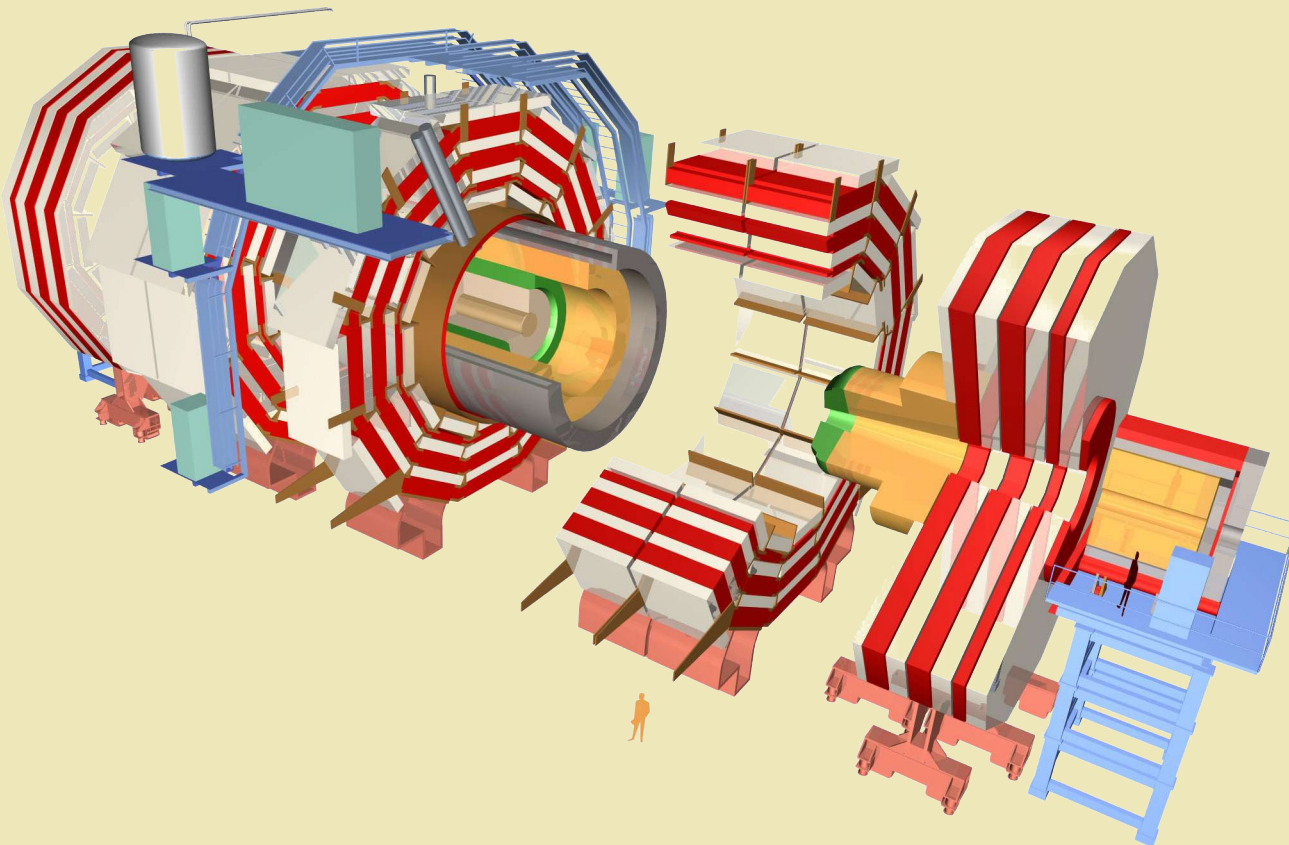
Stephan Wynhoff



The Challenge (1)



The CMS Detector @ CERN



CMS Data Taking:

Event rate: 150 events/second
Event size: 1.5 MB
Events/year: 1 billion
Total raw data/year:
1,500,000GB

CMS Collaboration:

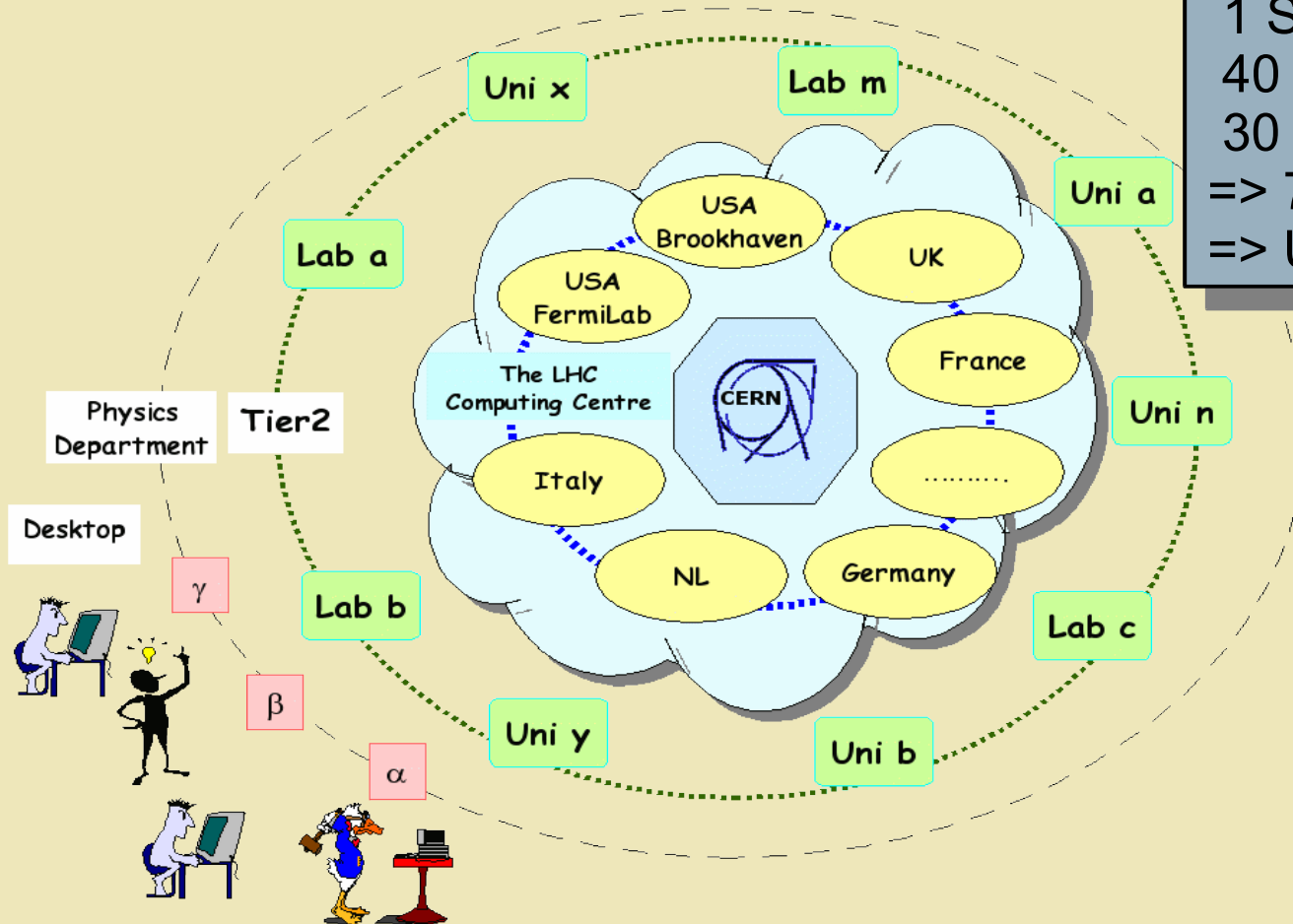
37 Countries
160 Institutes
2000 Scientists & Engineers

The Challenge (2)



The Grid @ localworld

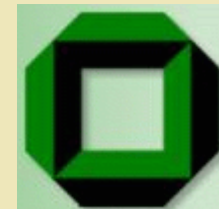
Typical CMS Software Installation:
 1 GCC compiler package
 1 SCRAM package
 40 CMS RPM packages
 30 LCG RPM packages
 => 72 packages of 1 GB in total
 => Unpacked: 4 GB of disk space



Wide-spread illness: Acronymitis
 CMS: Compact Muon Solenoid
 LHC: Large Hadron Collider
 LCG: LHC Computing Grid
 RPM: RedHat Package Manager
 SCRAM: Software Configuration, Release And Management



Requirements



Goal: Provide complete CMS software environment for development and data analysis

Desirable properties of experiment software installations:

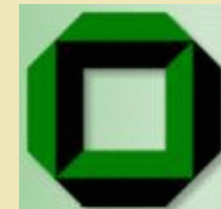
- Relocatable packages
- No root privileges required
- Optional network download
- Batch mode installable
- Save-able and reusable set-up
- Included validation procedure
- Concise configuration also for less experienced users
- Multi-platform support
- Multiple installations possible

The preparation of suitable packages in the form of RPMs is the topic of the next talk T 407.4 by Andreas Nowack

LCG Grid installations in general are topic of tomorrow's computing session T 508



Solution for CMS: xcmsi (1)



Configuration GUI

Choose software to install:
- Tags: Select set(s) of RPMs resolving dependencies
- Archives: Select single or multiple RPMs

Load configuration (optional)

Change configuration (if necessary)

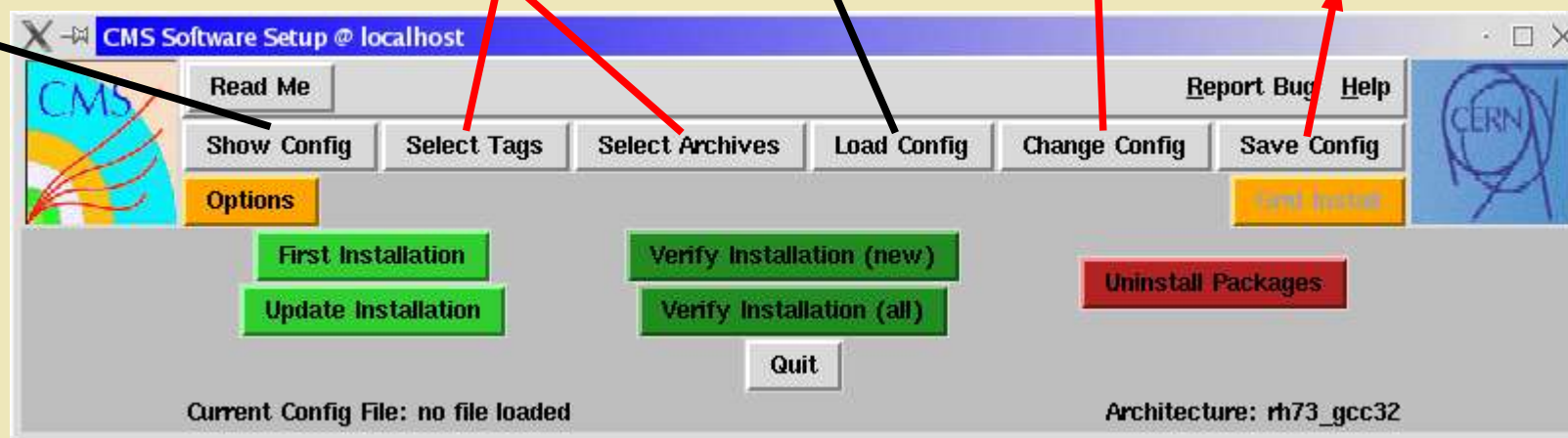
Save configuration:
- Mandatory to transfer configured settings to command-line installer

Show configuration (optional)

1.

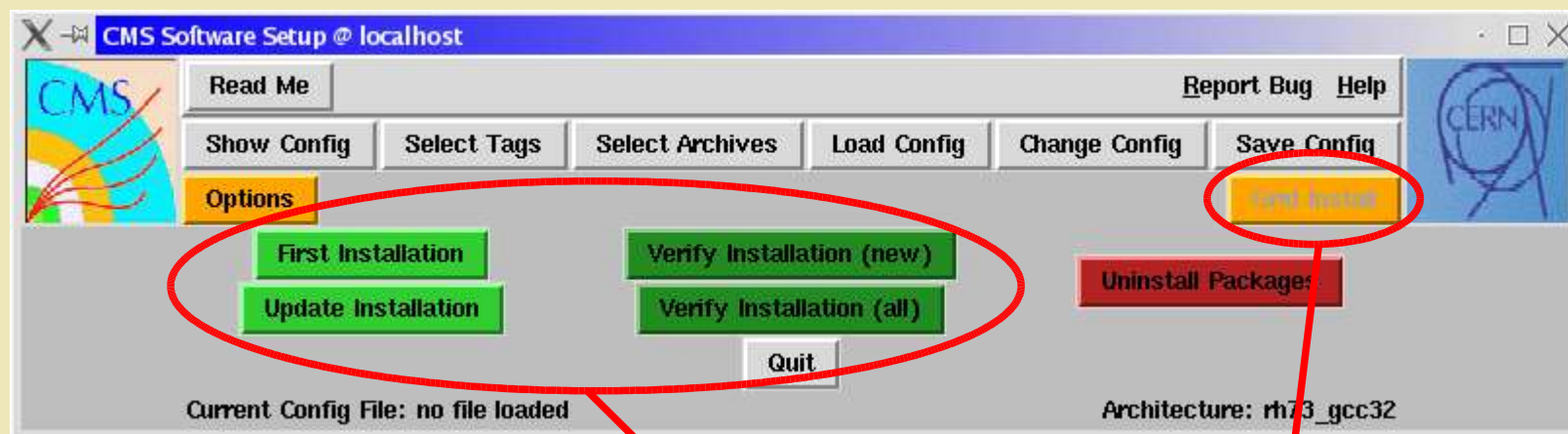
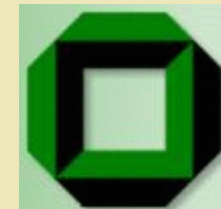
2.

3.





Solution for CMS: xcmsi (2)



Command-line installation

4. Start, verify or update installation

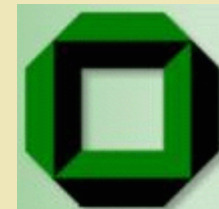
Installation on single PC/Notebook

```
cmsi.pl  
-f cmsset_default.csh  
-d "ORCA_8_7_1 OSCAR_3_6_5"
```

Installation on LCG Grid sites

```
msgsg.pl  
-t rpm -s fzk.de  
-i "ORCA_8_7_1 OSCAR_3_6_5"
```

An Installation Example (1)



Local part:

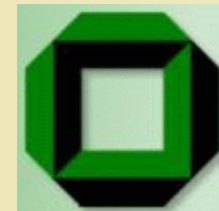


```
cmsi.pl  
-f cmsset_default.csh  
-d "ORCA_8_7_1 OSCAR_3_6_5"
```

Default installation procedure (cmsi.pl):

- Parse configuration file (cmsset_default.csh)
- Copy system RPM database (working on alternative ...)
- Download RPM lists for selected installs from CERN
- Prepare lists of RPMs to be installed
- Check compiler strategy (binary RPM, system compiler, ...)
- Start installation of: GCC compiler, SCRAM, LCG, CMS RPM packages
- Final corrections

An Installation Example (2)



Grid part:



```
cmsg.pl  
-t rpm -s fzk.de  
-i "ORCA_8_7_1 OSCAR_3_6_5"
```

On LCG sites the default software installation area is given by the variable `$VO_CMS_SW_DIR`

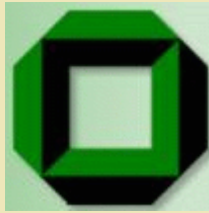
Preparations:

- Find compute element(s) (CE)
- Check against installed software
- Prepare tar.gz archive of `xcmsi`
- Generate executable to submit
- Prepare job description file (`jd1`)
- Submit `jd1` file (`edg-job-submit`)
- Start job monitor to fetch output after completion

Generated executable:

- Check on `$VO_CMS_SW_DIR`
- Check disk space
- Generate default configurations (first install only)
- Call installer `cmsi.pl`
- Copy configuration to default software area (first install only)
- Publish new software

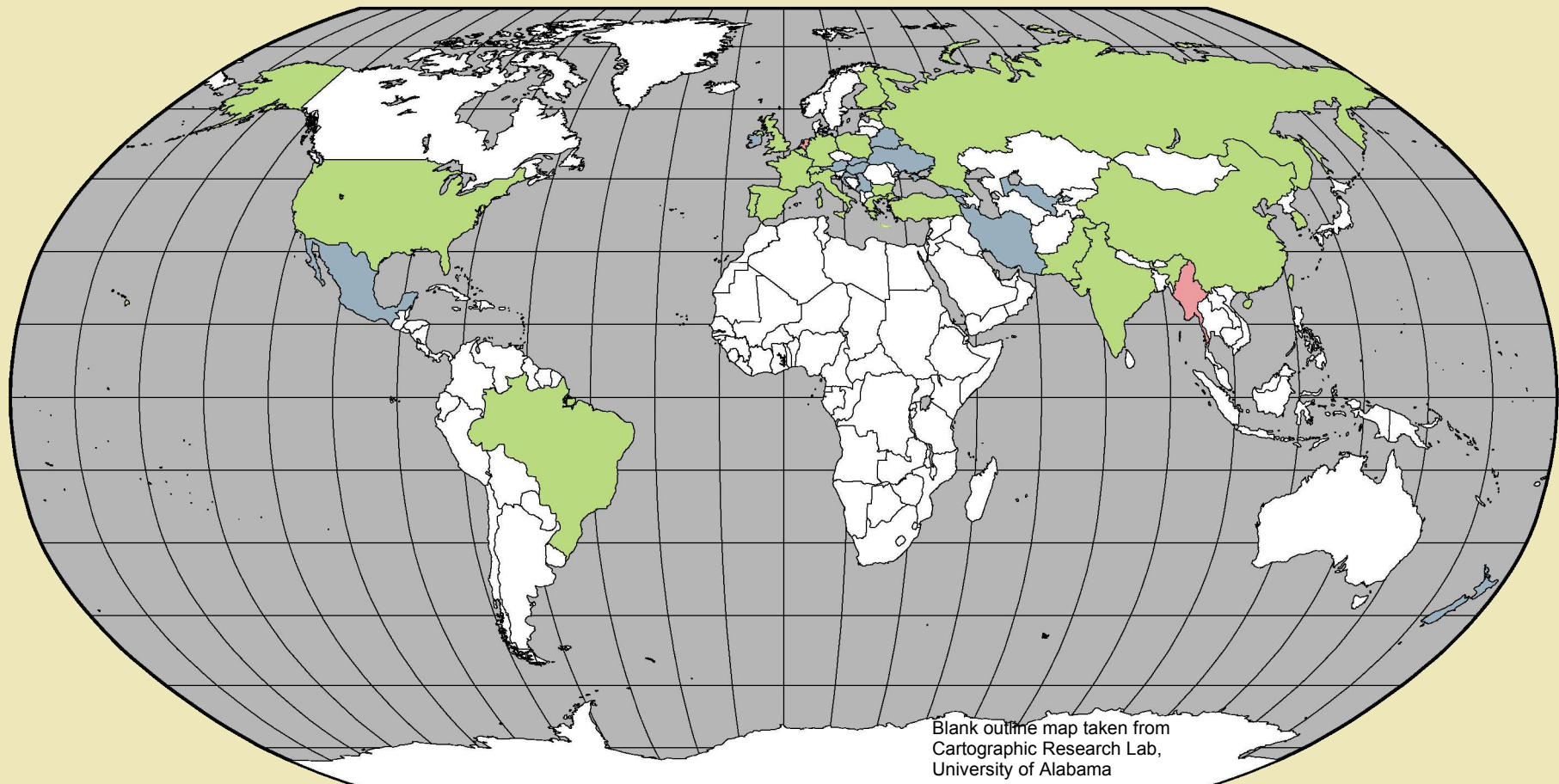
Distribution Status



15 Countries with CMS Institutes
and NO registered download

22 Countries with CMS Institutes
and registered downloads

2 Countries without CMS Institute
BUT registered download





Outlook



- ➔ Detail improvements (RPM database, Grid Install button ...)
- ➔ Monitoring of software status on grid sites
- ➔ Automate installations of new releases
- ➔ Web service to subscribe for automatic installations on grid sites

For more information see:

- Download page: <http://cern.ch/cms-xcmsi>

- Bug reporting page: <http://savannah.cern.ch/projects/xcmsi>