

Visualizing the State of the Grid with *GridMaps*

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CERN openlab / EDS

Quarterly Review, 9 Oct 2007

Outline

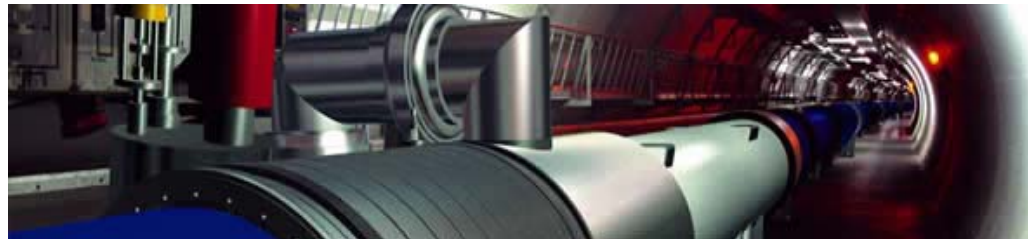
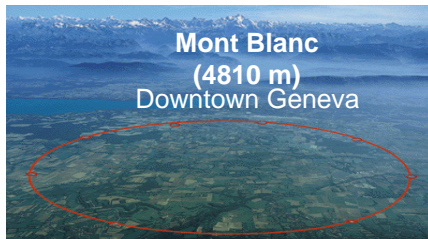
- Collaboration CERN openlab / EDS
- Motivation
- *GridMap* Visualization
- Prototype
- Conclusions

Collaboration CERN openlab / EDS

EDS is a contributor member of the CERN openlab

The purpose of the joint project between CERN and EDS is to carry out research and development in the field of *monitoring, management and operation of Grid services*.

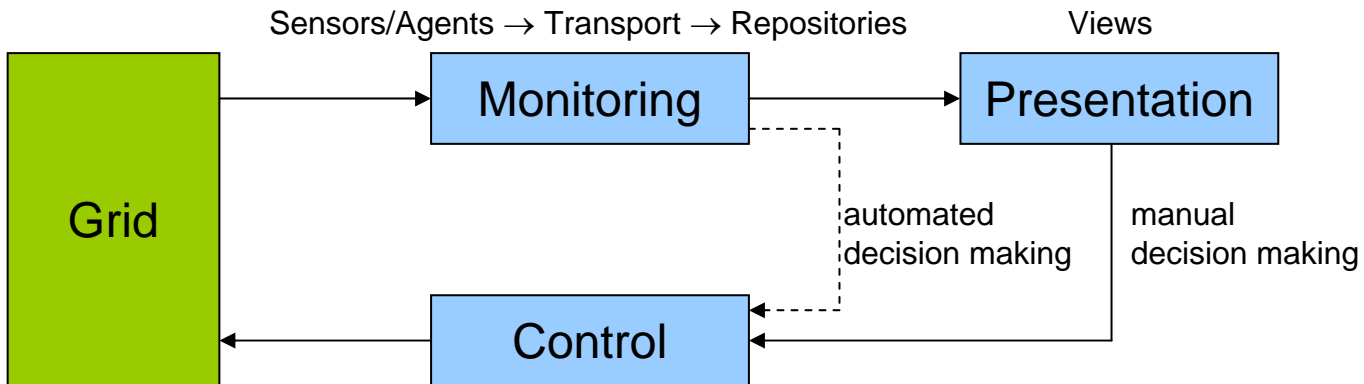
The CERN openlab is a framework for evaluating and integrating cutting-edge IT technologies or services in partnership with industry



Motivation

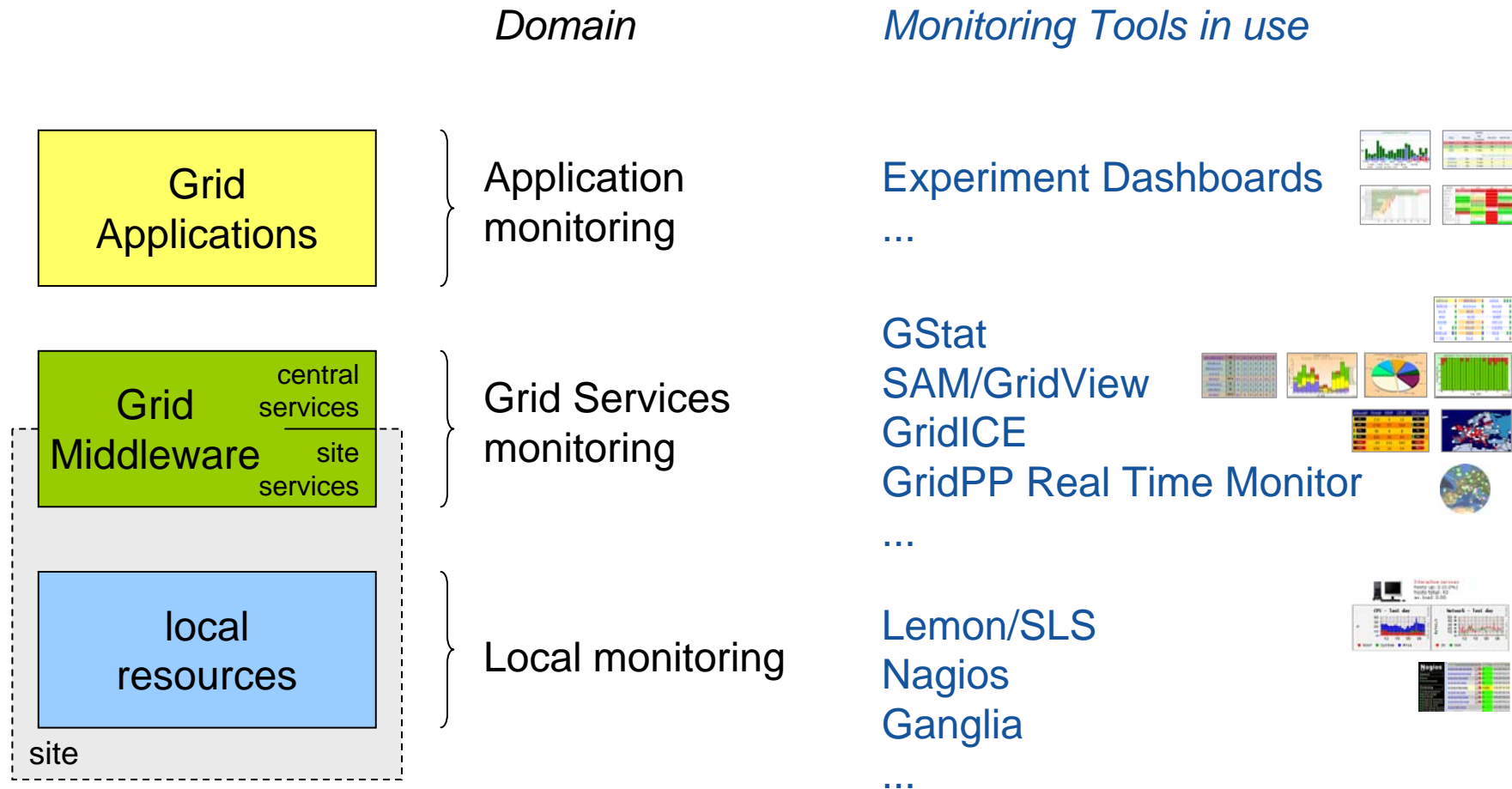
Better understanding the *state of the Grid* helps improve the *reliability* of Grid services

"You can't manage what you don't measure"



Motivation

Many Grid monitoring tools are in use



Motivation

But...

The Grid is a large distributed infrastructure

Grid monitoring data are complex!

Current tools visualize data by sorted tables, bar charts, etc.

*Difficult to present an easy to understand **top-level view** which provides*

- quick, action oriented oversight and insight
- help understand job failures and availability patterns

Can new visualizations help?



GridMap Visualization

GridMap Visualization

Idea

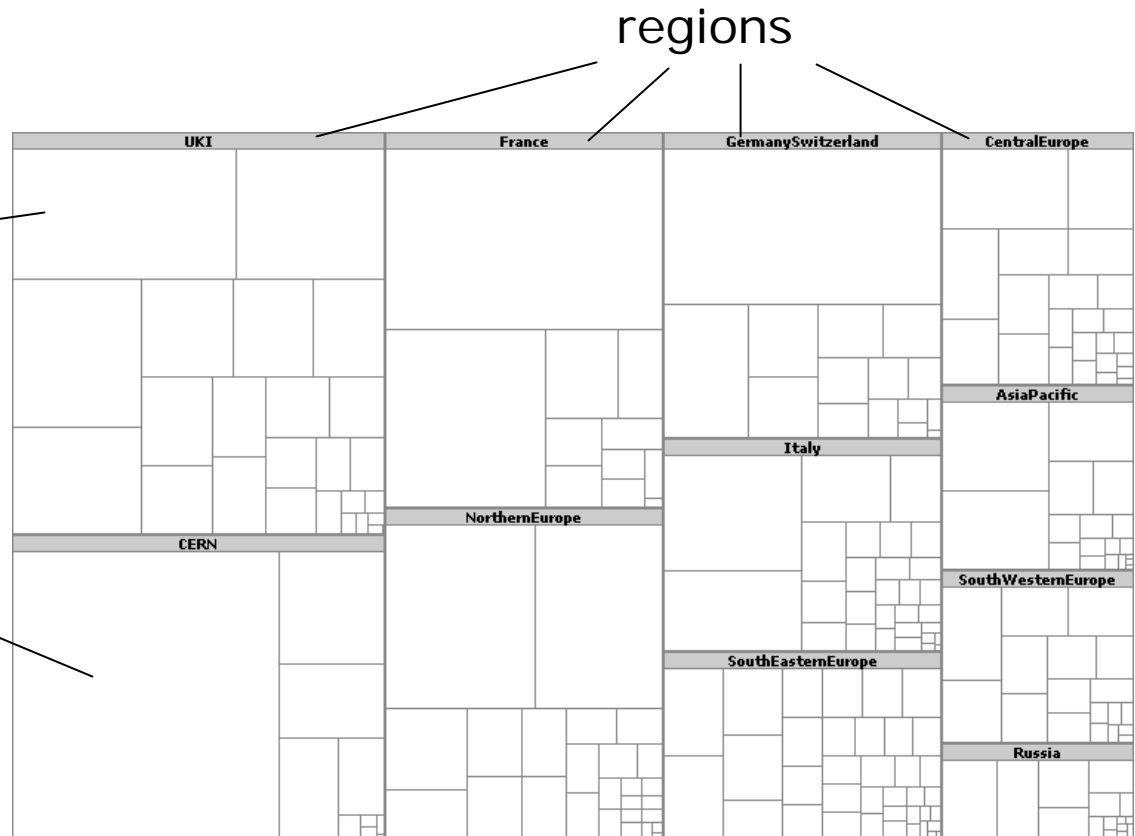
- visualize the Grid by using *Treemaps*
(Grid + Treemap = *GridMap*)

Example *GridMap*

site

Size of rectangle is e.g.

- size of site (#CPUs)
- #running jobs
- ...



GridMap Visualization

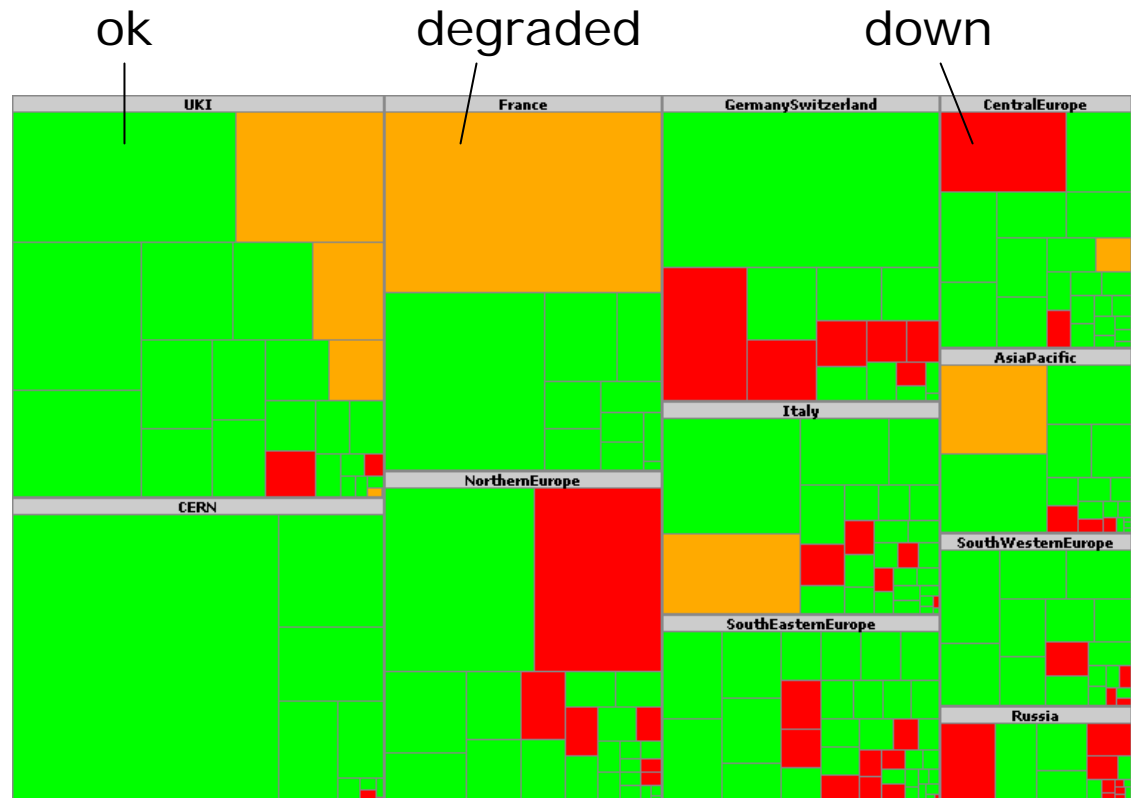
Idea

- visualize the Grid by using *Treemaps*
(Grid + Treemap = *GridMap*)

Example *GridMap*

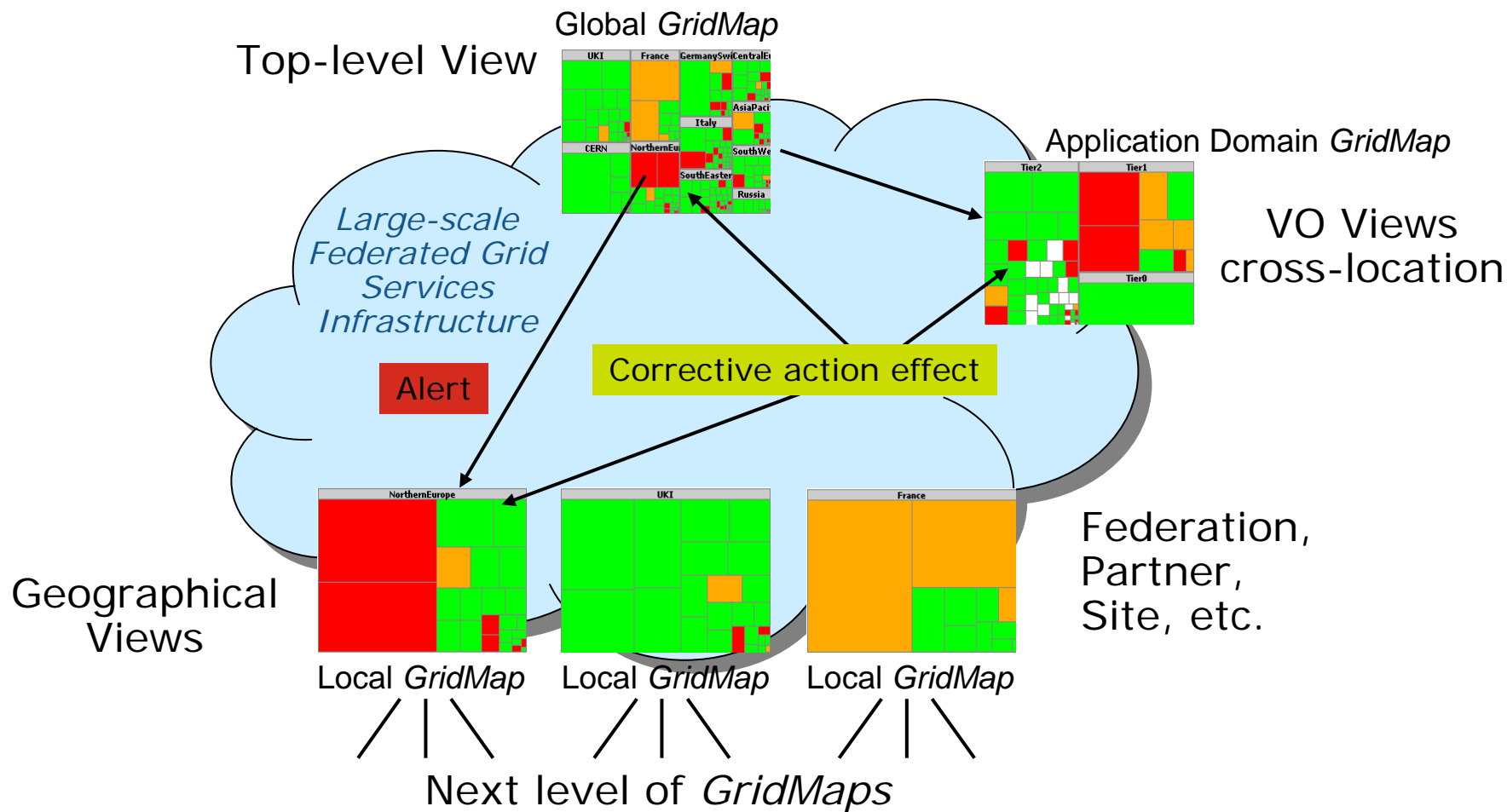
Colour of rectangle is e.g.

- SAM status of site / service
- Availability of site / service
- ...



Multiple Views

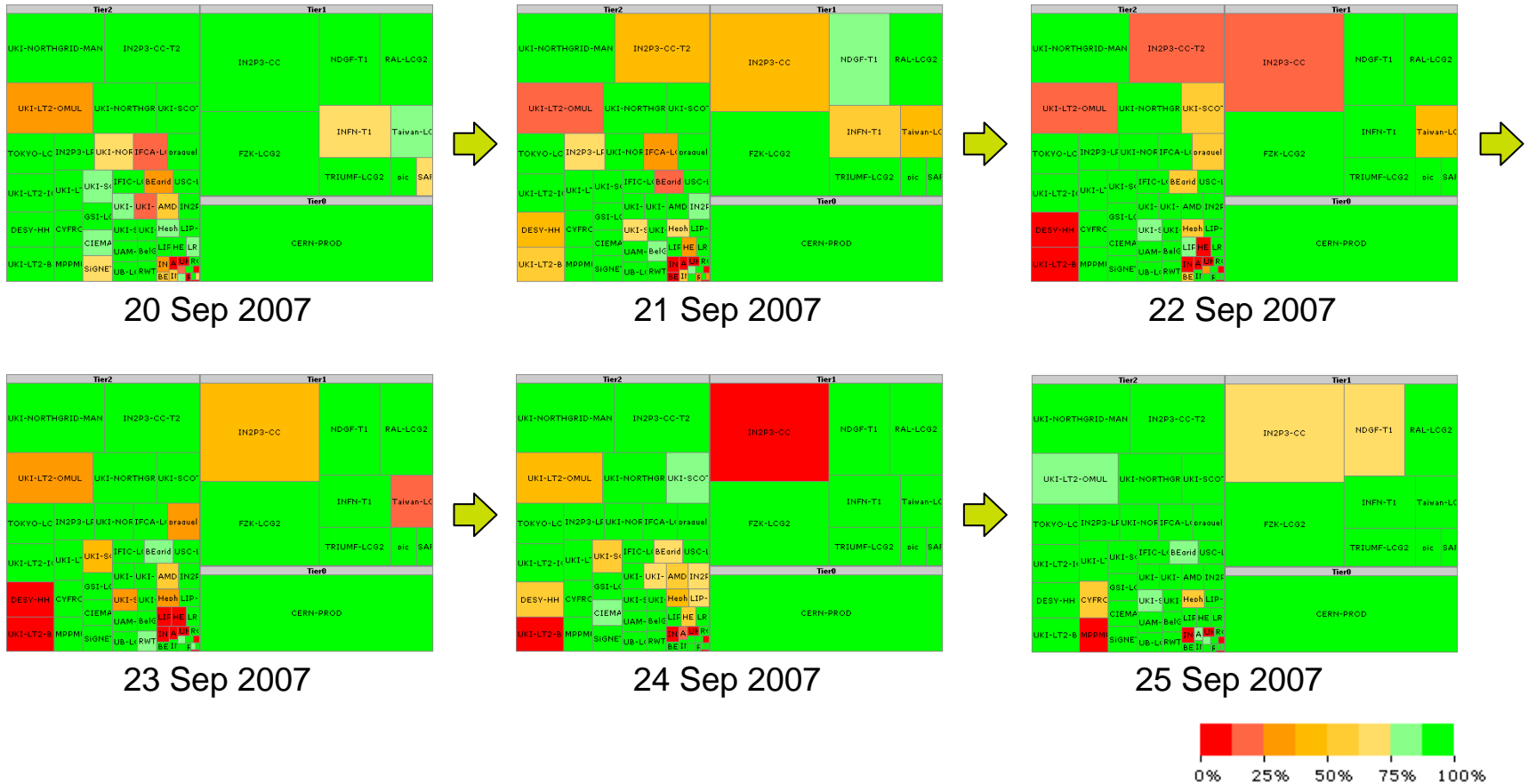
GridMaps can be used for *top-level*, *geographical* and *VO* views



Trends

Trends can be understood by looking at a sequence of *GridMaps*

Site Availability over time:

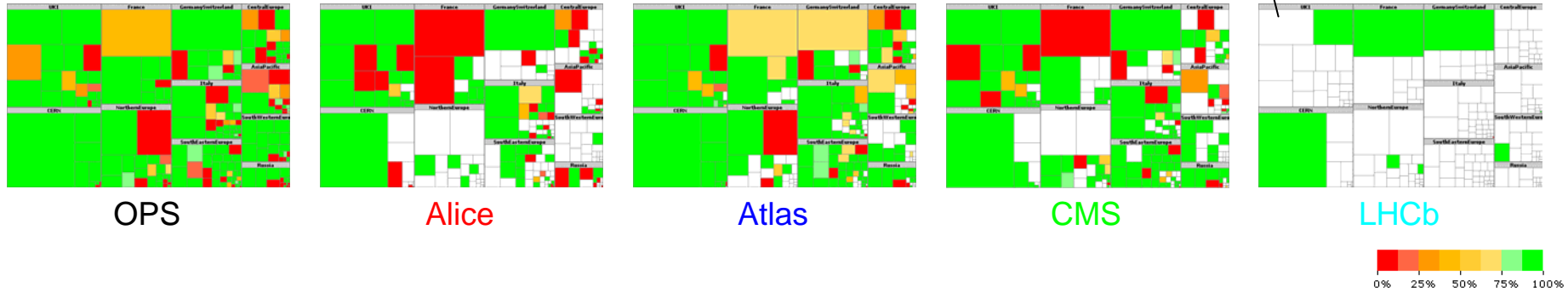


More Views

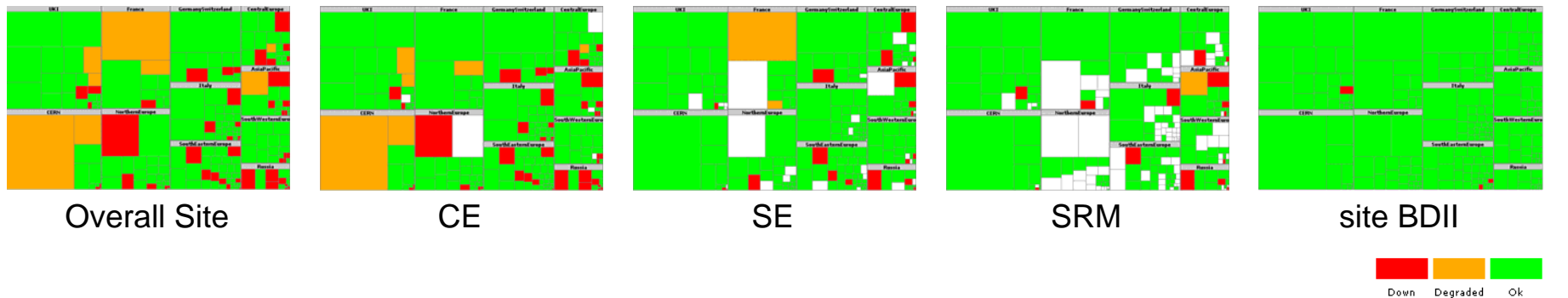
Correlations of metrics can be discovered by switching between different views

Site Availability from different VO perspectives:

sites without colour do not support the VO

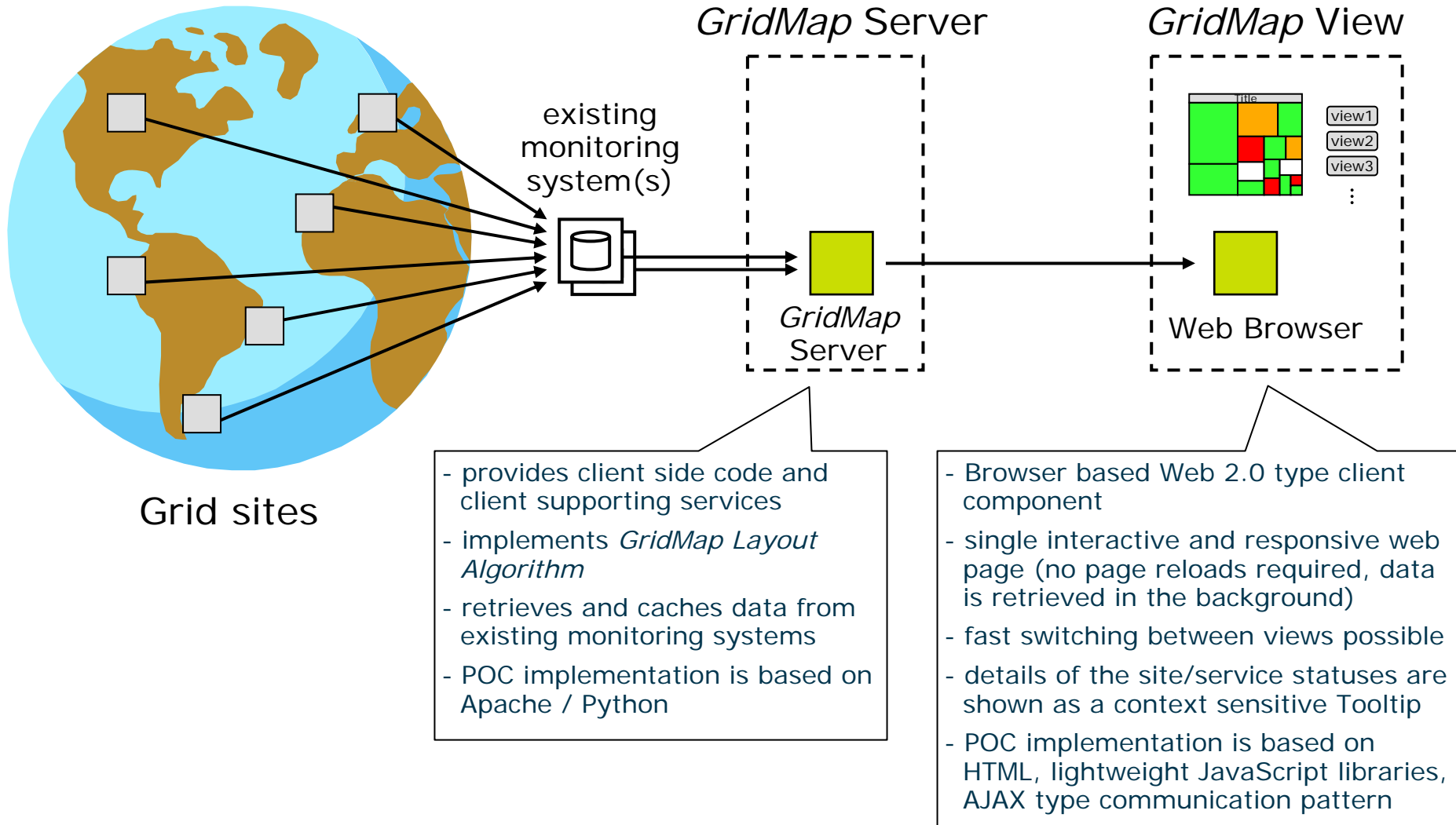


Status of different Site Services:



 Prototype

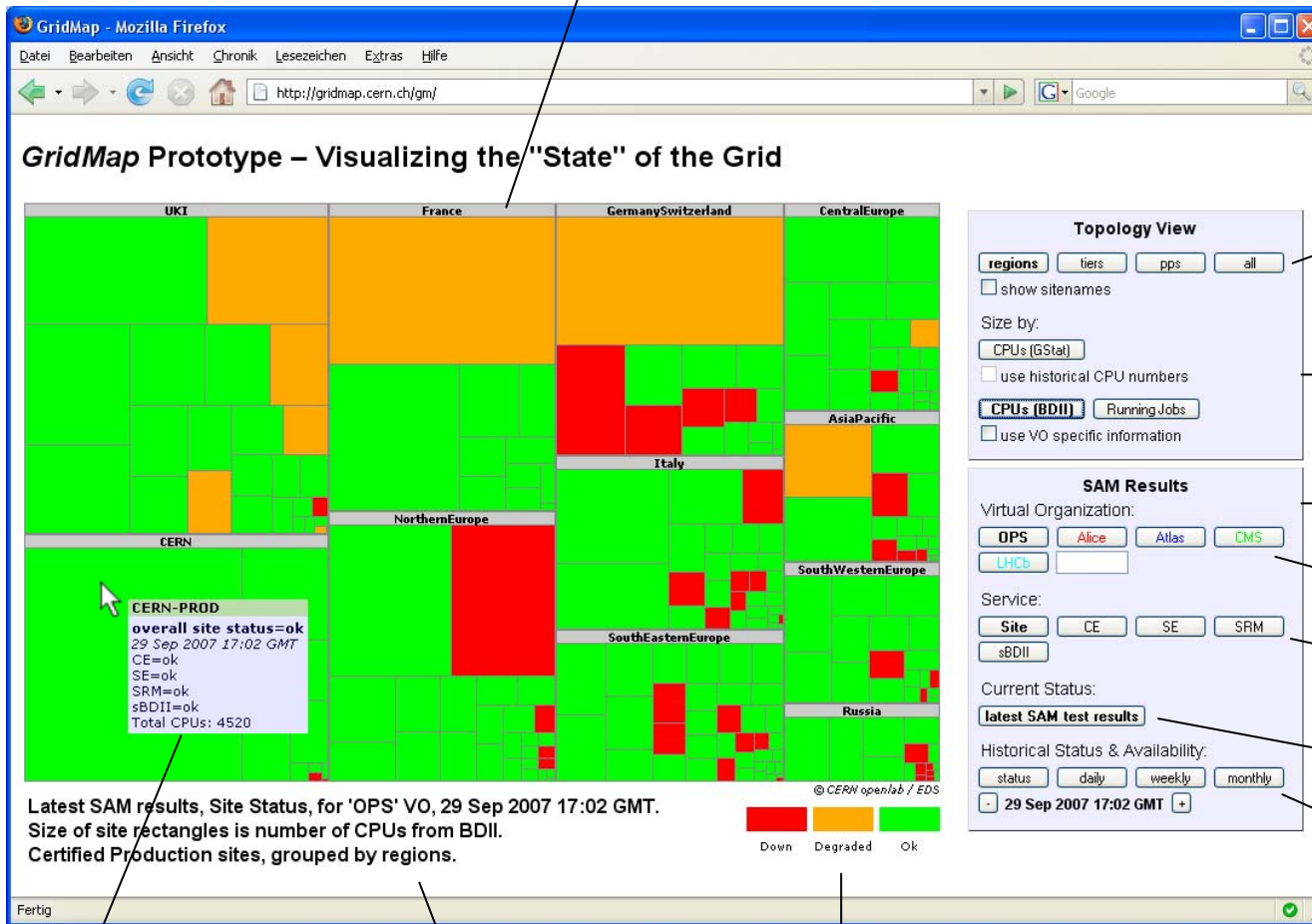
GridMap Prototype Architecture



GridMap Prototype View Component

Link: <http://gridmap.cern.ch>

Drilldown into region by clicking on the title



Grid topology view (grouping)

Metric selection for **size** of rectangles

Metric selection for **colour** of rectangles

VO selection

Overall Site or Site Service selection

Show SAM status

Show GridView availability data

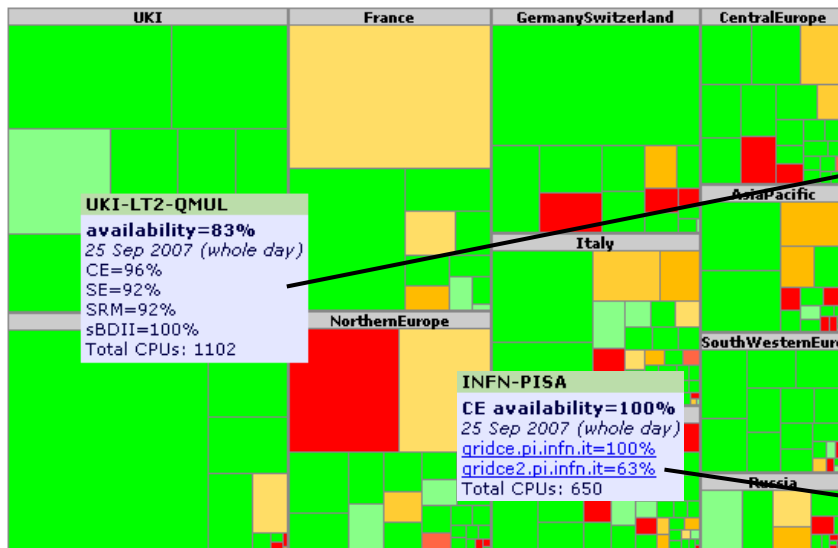
Context sensitive information

Description of current view

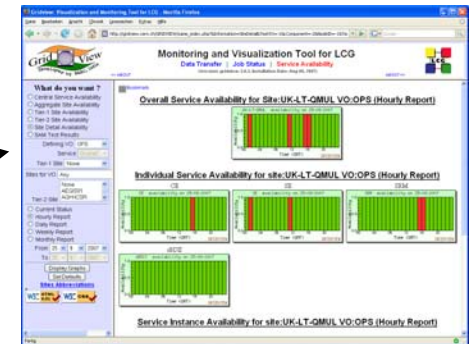
Colour Key

GridMap Prototype: Link to Existing Tools

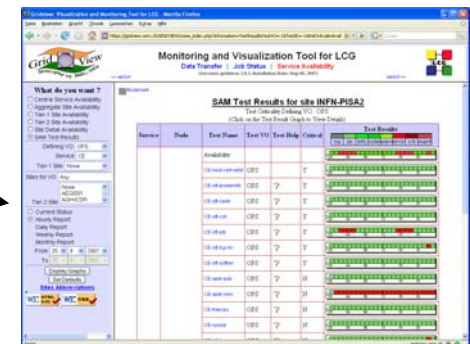
Clicking on a site opens a page with details in GridView/SAM



Site Detail Availability



SAM Test Results





Conclusions

Conclusions

- *GridMaps* are a new approach to visualizing complex monitoring data of the Grid
- The same type of visualization can be used for *top-level, regional,* and *VO* specific views
- *GridMaps* can identify correlations and availability patterns
- A prototype for visualizing SAM data has been implemented
- Can be used for visualizing other data, e.g. of experiments, alarms
- *GridMap* web component can be embedded into other tools, e.g. Dashboards (if you are interested, please contact us)
- *GridMaps* are a result of the *CERN openlab / EDS* collaboration which takes place within the *CERN-IT Grid Deployment* group

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