

Scientific Council of the CNRS  
Grid Institute



# Production Grids

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# Production grids overview

- The production grids in France are mainly based on the EGEE middleware
  - Some other interesting developments (later in this talk)
- France has been very active in EGEE since the very beginning
  - ... and even before (Datagrid project !)
- We now have a fully operational production infrastructure based on Grid technology

# French activities in EGEE-III

Involvement in:

- NA2: Dissemination and business
- NA3: Training
- NA4: User community support and expansion
  - HEP, Life science, Earth science, Chemistry, Astronomy & Astrophysics, Grid Observatory
- SA1: Operations
- Network support

Activity	NA2	NA3	NA4	SA1	SA2
Person Months	39	24	245	426	96

A total of 827 Person Months over a total of 9010 Person Months for the whole project

# Site availability and reliability

## Site availability

REGION	May '08	June '08	July '08	August '08
AsiaPacific	67	80	77	73
CentralEurope	82	74	84	77
CERN	75	78	80	86
France	92	94	86	90
GermanySwitzerland	71	74	86	88
Italy	67	65	87	87
NorthernEurope	74	81	84	81
Russia	67	77	83	92
SouthEasternEurope	77	77	81	80
SouthWesternEurope	75	75	81	85
UKI	78	84	85	86
ROC Average	75	78	83	84

Critical SAM Tests

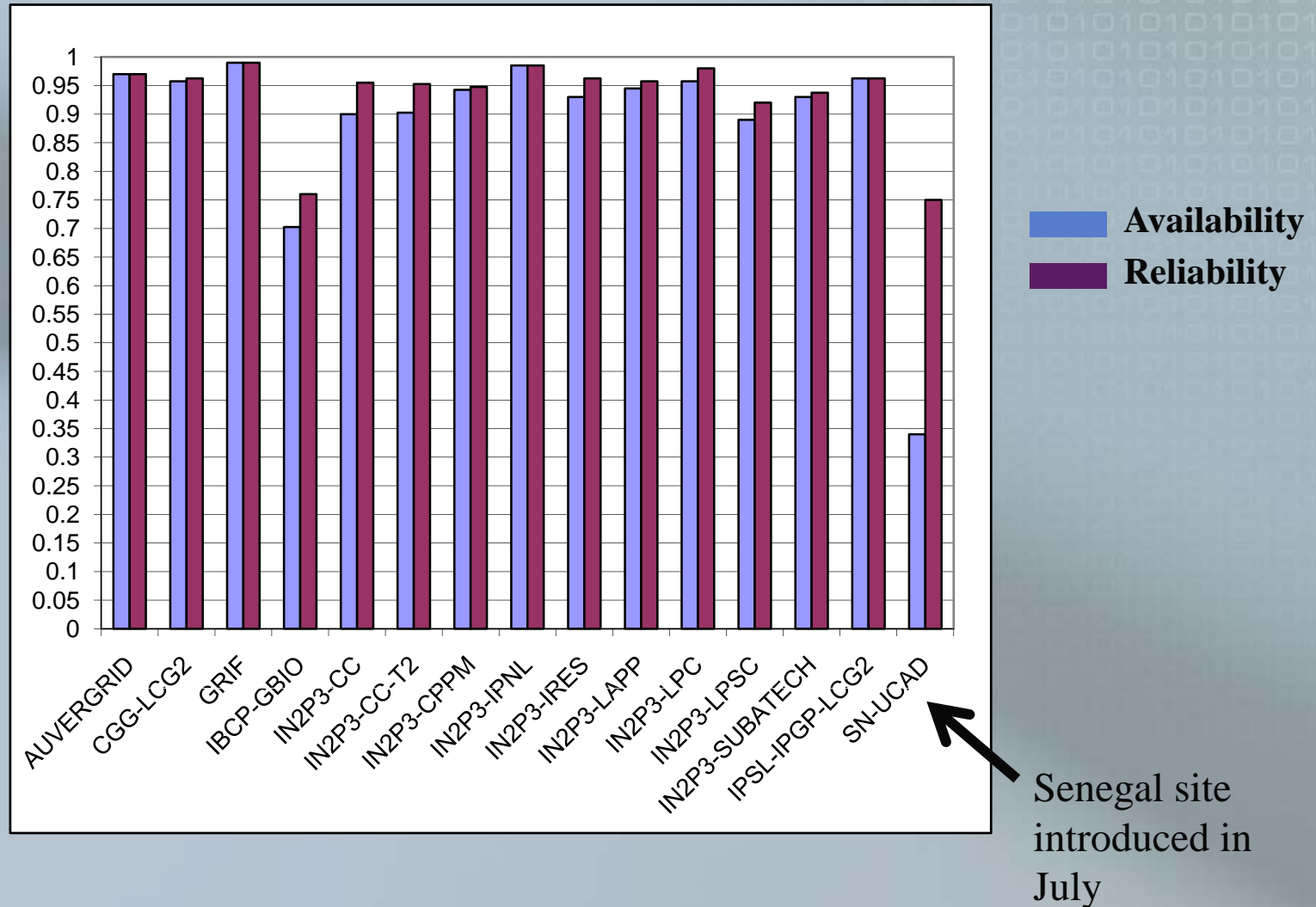
Availability = % of successful tests

Reliability = Availability / Scheduled  
Availability

## Site Reliability

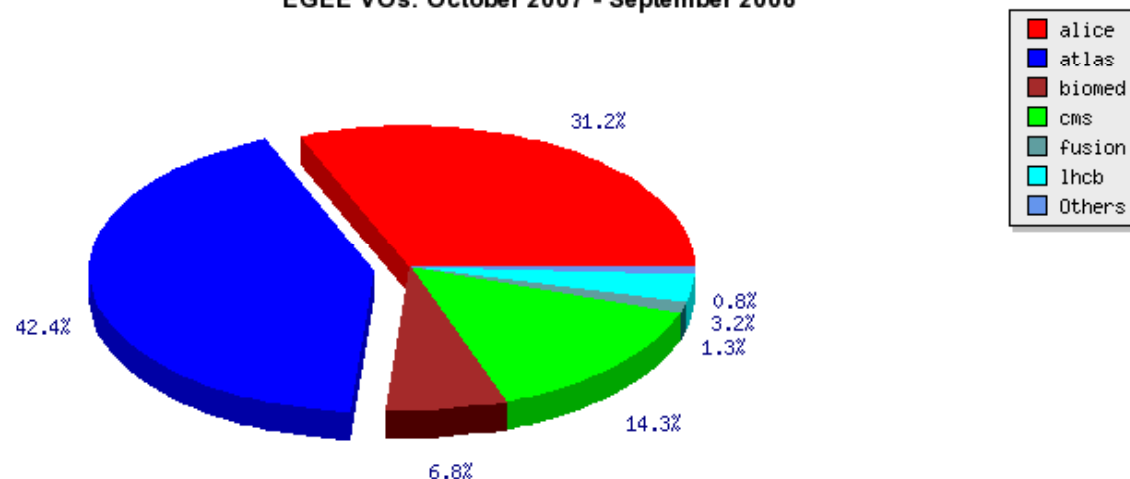
REGION	May '08	June '08	July '08	August '08
AsiaPacific	69	83	79	78
CentralEurope	89	84	89	80
CERN	79	81	81	92
France	95	96	91	94
GermanySwitzerland	76	76	87	89
Italy	77	72	91	92
NorthernEurope	78	84	87	88
Russia	69	79	84	93
SouthEasternEurope	80	83	85	86
SouthWesternEurope	79	83	84	91
UKI	86	93	92	94
ROC Average	80	83	86	89

# Site availability and reliability

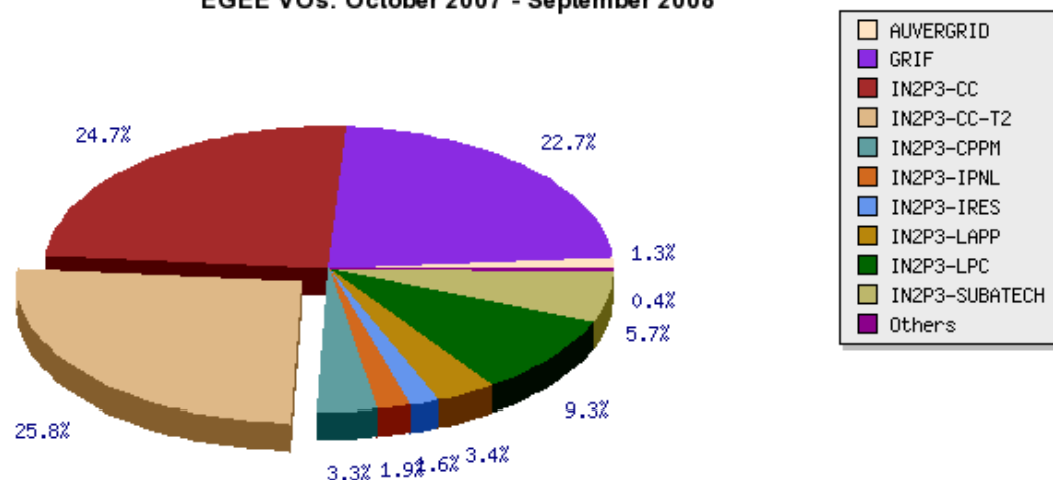


# CPU Usage in EGEE sites

France Normalised CPU time per VO  
EGEE VOs. October 2007 - September 2008



France Normalised CPU time per SITE  
EGEE VOs. October 2007 - September 2008



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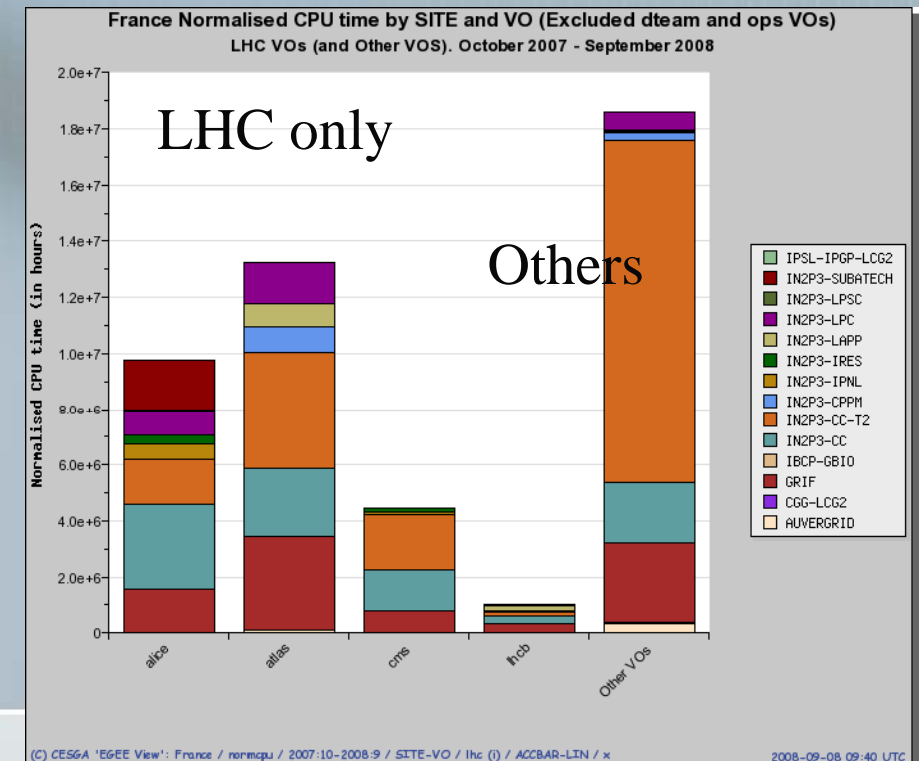
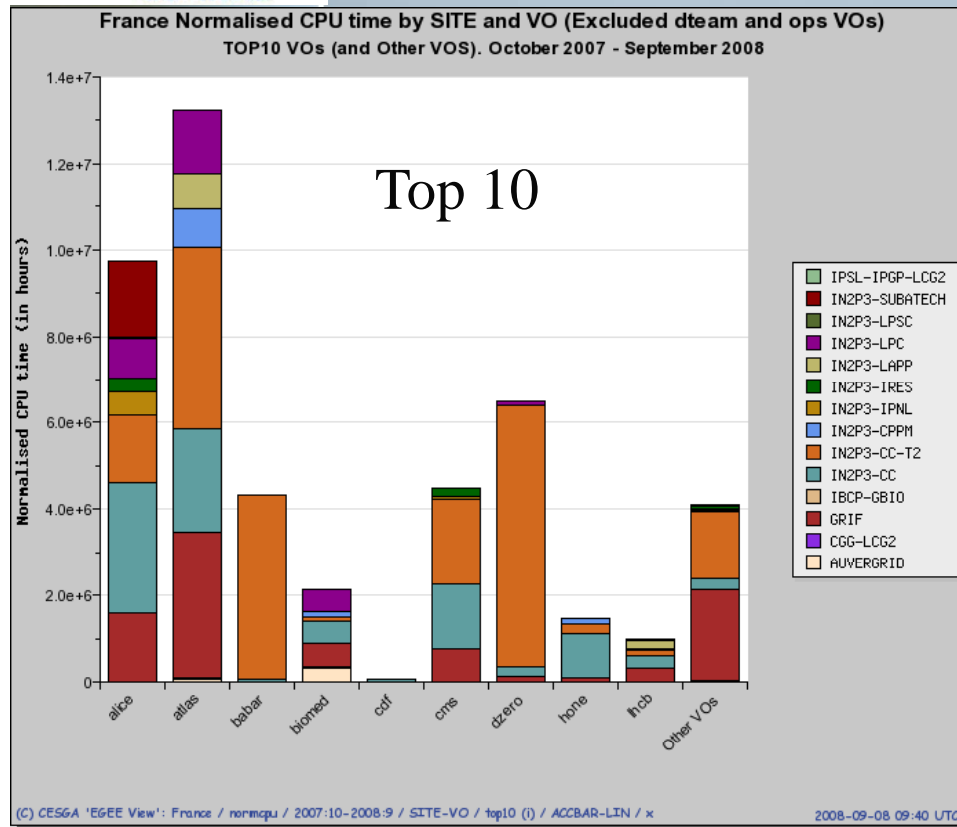
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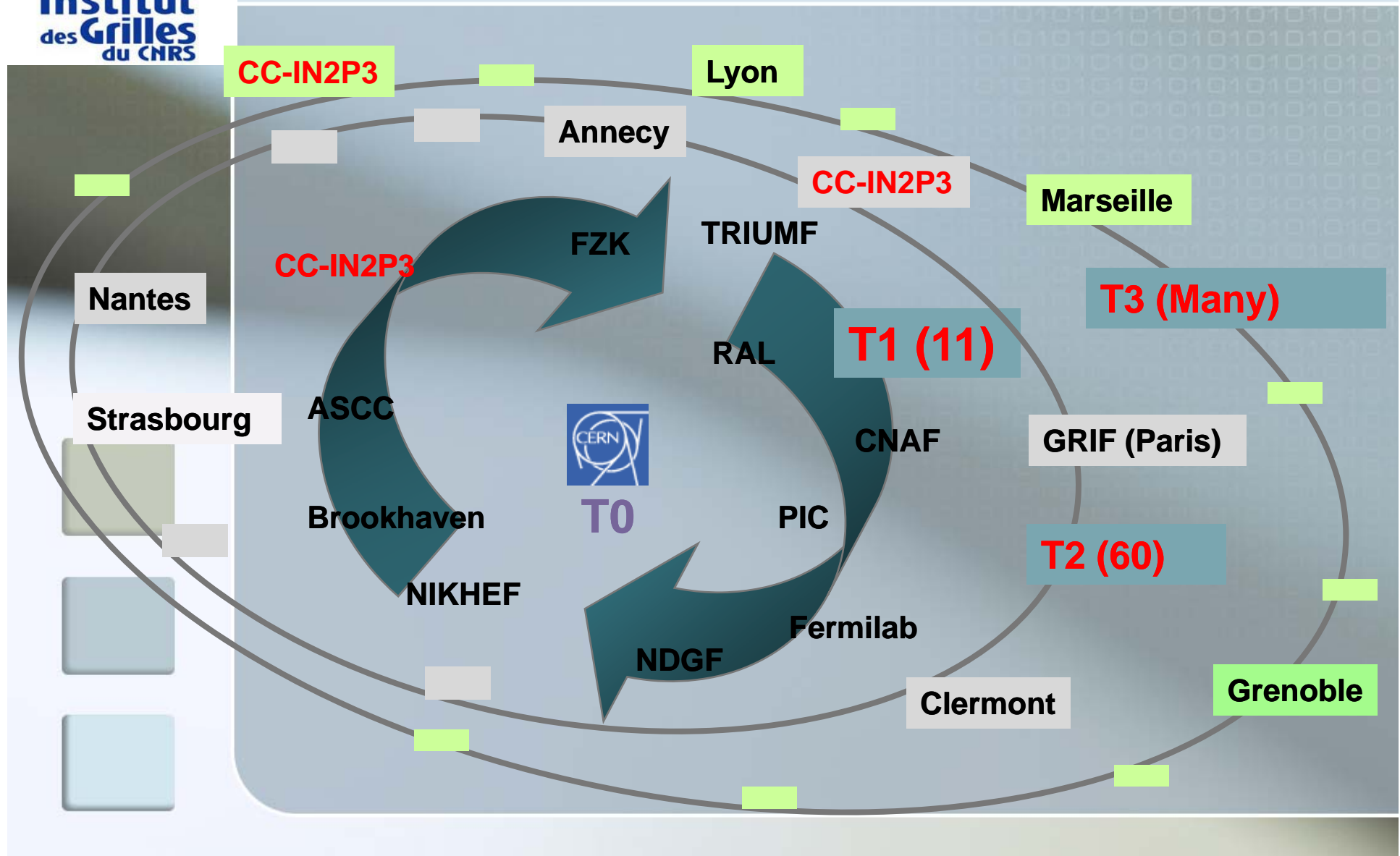
# CPU Usage in EGEE sites

Sites other than CC-IN2P3 have significant contributions

In total 54 VO are supported excluding dteam and ops



# The LHC Computing Grid



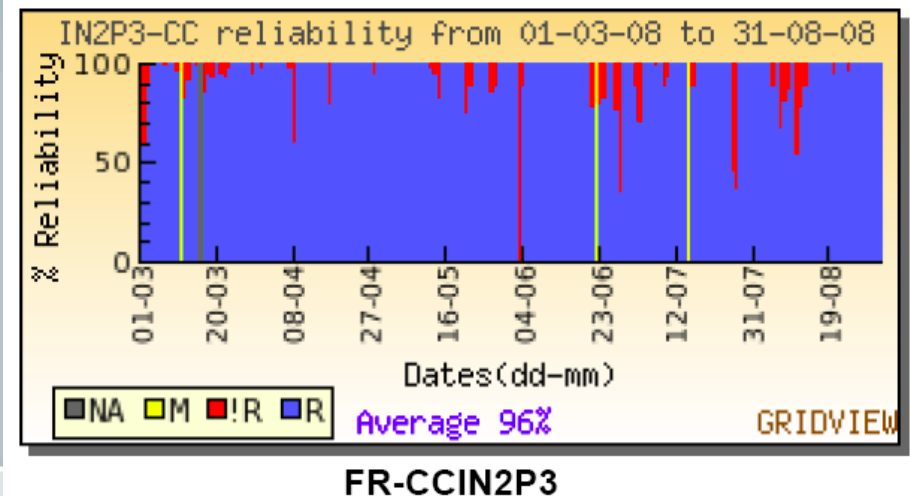
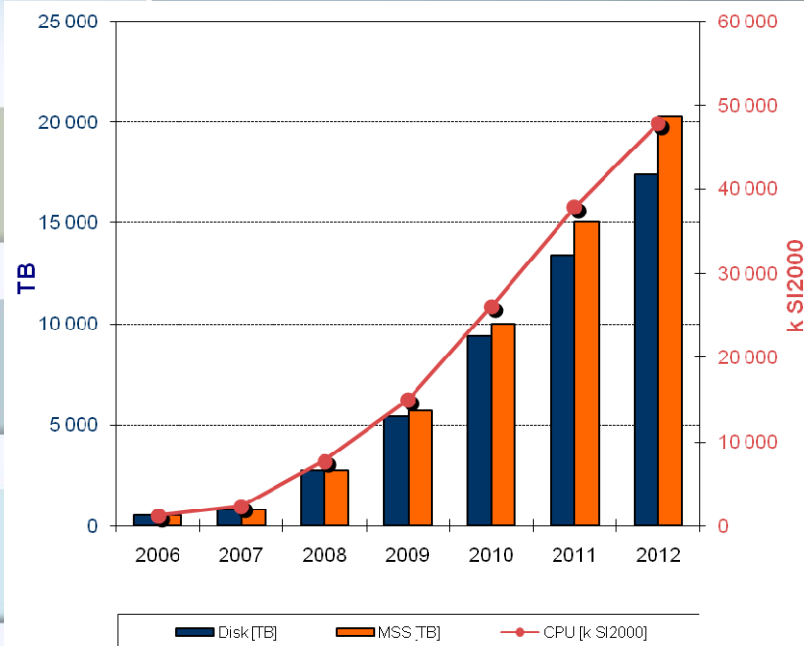


# The French Tier-1 + Analysis Facility

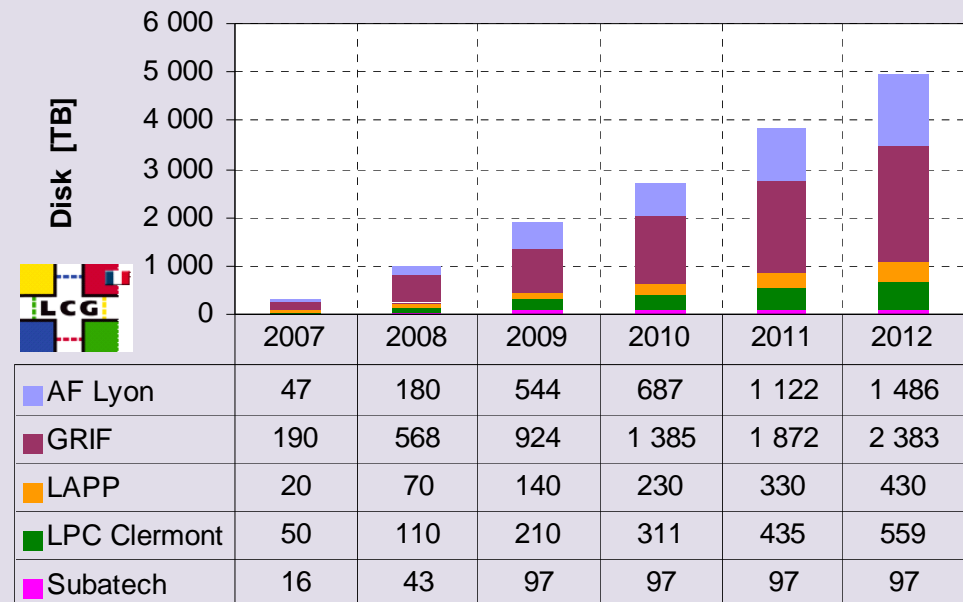
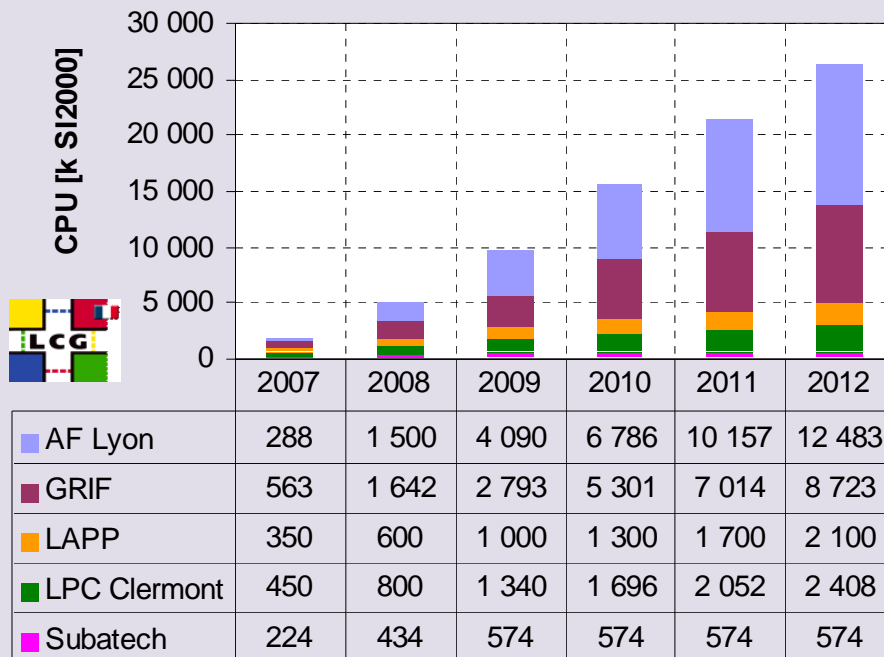
CEA + CNRS

Total Required Budget (Tier-1 + AF)

	2007	2008	2009	2010	2011	2012	2007-2012
CPU	0.94	1.34	1.22	1.20	1.20	1.06	6.96 M€
Disk	1.23	1.82	1.67	1.46	1.37	1.36	8.91 M€
MSS	0.87	1.32	1.51	1.44	1.46	1.64	8.23 M€
Σ Equipment Cost (acquisition + operation)	3.03 M€	4.48 M€	4.41 M€	4.10 M€	4.03 M€	4.06 M€	24.10 M€
Contingency (15% of equipment cost)	0.46 M€	0.67 M€	0.66 M€	0.61 M€	0.60 M€	0.61 M€	3.62 M€
Total Required Budget (equipment cost + contingency)	3.49 M€	5.15 M€	5.07 M€	4.71 M€	4.64 M€	4.67 M€	27.72 M€
Target Budget	5.19 M€	5.60 M€	5.02 M€	4.60 M€	4.60 M€	4.60 M€	29.61 M€



# Tier-2 capacity and reliability

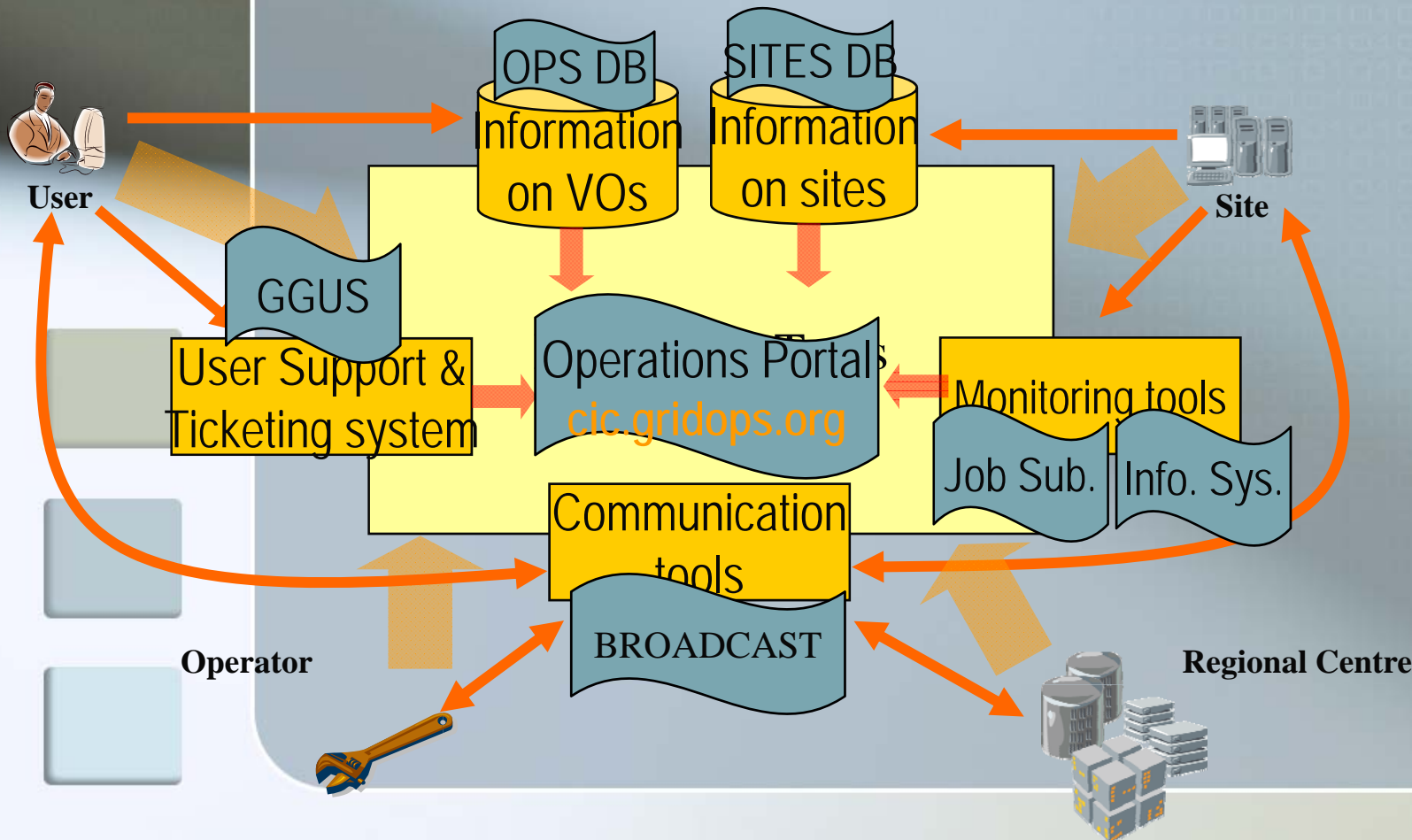
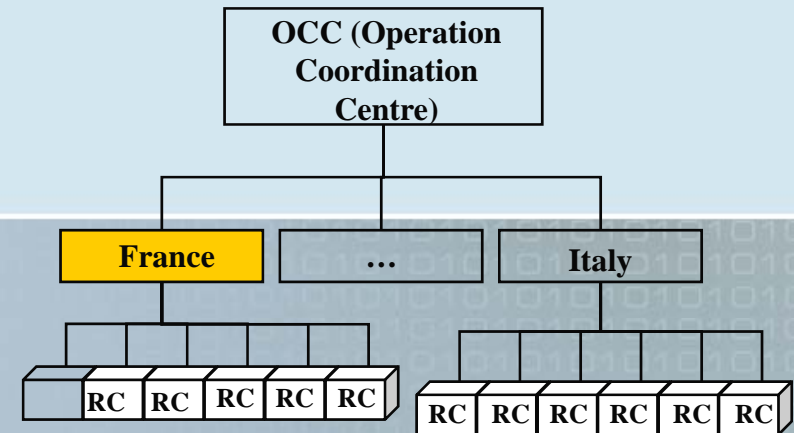


FR-GRIF ( France, GRIF, Paris )						
GRIF		99 %	99 %	99 %	100 %	98 %
FR-IN2P3-CC-T2 ( France, CC-IN2P3 AF )						
IN2P3-CC-T2		95 %	94 %	98 %	95 %	93 %
FR-IN2P3-LAPP ( France, LAPP, Annecy )						
IN2P3-LAPP		97 %	92 %	100 %	99 %	97 %
FR-IN2P3-LPC ( France, LPC, Clermont-Ferrand )						
IN2P3-LPC		99 %	99 %	98 %	100 %	95 %
FR-IN2P3-SUBATECH ( France, SUBATECH, Nantes )						
IN2P3-SUBATECH		97 %	96 %	96 %	92 %	90 %

Very good T2  
reliability so far

# Grid operation

Grid usability critically depends on the quality of the operation tasks



# ROC FR : Communication Channels

## ■ Internal

- Visio conferences (15 days)
  - French participants
  - circulation of news
    - exploitation coordination
    - minutes of EGEE meetings
    - etc.
  - exchange area between French participants and EGEE
    - specific topic meetings: security, certification authority, MPI, GGUS...
- Mailing list EGEE SA1-Fr

## ■ External

- "ROC Managers' meeting" phone conference (15 days)
- "WLCG Weekly operation meeting" (weekly)
  - weekly report about French site status
- "All ROC managers meeting" (~ 3-4 months)

# CIC portal: putting all together

CIC: Core Infrastructure Centers

- <http://cic.gridops.org/>
- Developed and operated by CC-IN2P3, failover instance at CNAF
- Web portal for integrating all the tools and sources of operations-related information into one single place
  - Provides and maintains an integrated operations dashboard for grid on duty operator
  - Provides mechanisms for keeping information needed for appropriate hand over between operators on duty
  - Easy access to appropriate contact information on every actor involved in the operations of the grid
  - Provides communication tools





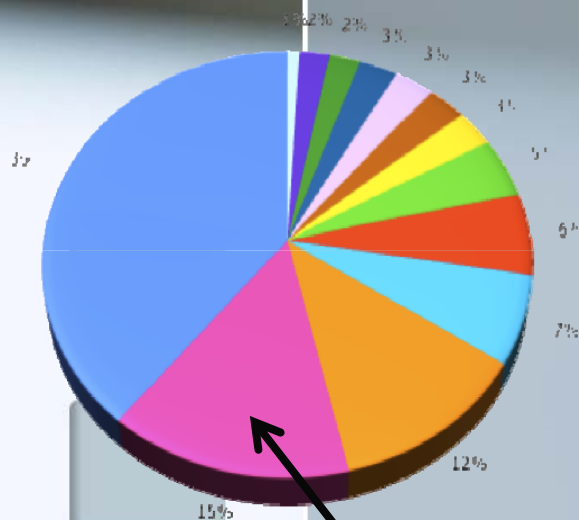
# A success story

- WISDOM: <http://wisdom.healthgrid.org/>
- Goal: find new drugs for neglected and emerging diseases
  - Neglected diseases lack R&D
  - Emerging diseases require very rapid response time
- High throughput virtual molecular docking

**WISDOM II:** Over 420 CPU years in 10 weeks

A record throughput of 100.000 docked compounds per hour

Several promising compounds have been found – Some are being tested in vitro / in vivo



French sites' contribution



# Regional Grids

## Interest:

- Provide an alternative way to fund grid nodes
  - CPER
- Federates scientific teams which are geographically close
  - Helps to initiate multidisciplinary projects
- A door opened to the economical world

# Regional grids

## ■ AUVERGRID

- Historically the first in France
- Driven by LPC (Clermont Ferrand)
- 11 nodes ~1000 cores - > 100 TB

## ■ GRIF (Paris)

- 5 IN2P3 labs + CEA/Irfu
- 80% LHC oriented – 20% opened to Life Science, Earth Science, Astrophysics...
- Connection to other projects: Campus grid – IT research – High bandwidth network R&D (CARIOCAS)

## ■ Rhône-Alpes Grid

- Just emerging now
- Dedicated manpower at CC IN2P3
- Connection with regional medium size computing centers

# Other Grid activities

- Connection with IT research project
  - Paris region
  - Rhône-Alpes
- Light weight Grid development
  - CiGri project
  - Best effort system in order to use idle CPU cycles
- Developments on grid Interoperability
  - JSAGA development at CC-IN2P3  
<http://grid.in2p3.fr/jsaga/>
  - Efficient jobs submission to several grid infrastructures with a single job description
  - Based on OGF standard: JSDL and SAGA

# Data Grids

- CC-IN2P3 is very active on SRB / iRODS
  - Several scientific project using SRB / iRODS
    - Life Science - Humanities
- CC-IN2P3 will contribute to a SC2008 computing challenge
  - iRODS usage for LSST data

# Conclusions

- A lot of activities around production grids were going on in France before the IdG creation
- IdG is federating all these efforts
- It helps to create new activities and grid nodes
  - Hopefully it will be able to get enough resources in the future in order to be able to fund important actions
- It provides a formal framework to evaluate the projects and outcomes
- It gives a strong visibility to Grid activities in France