**egee**

Enabling Grids for E-sciencE

# eNOC overview & plan
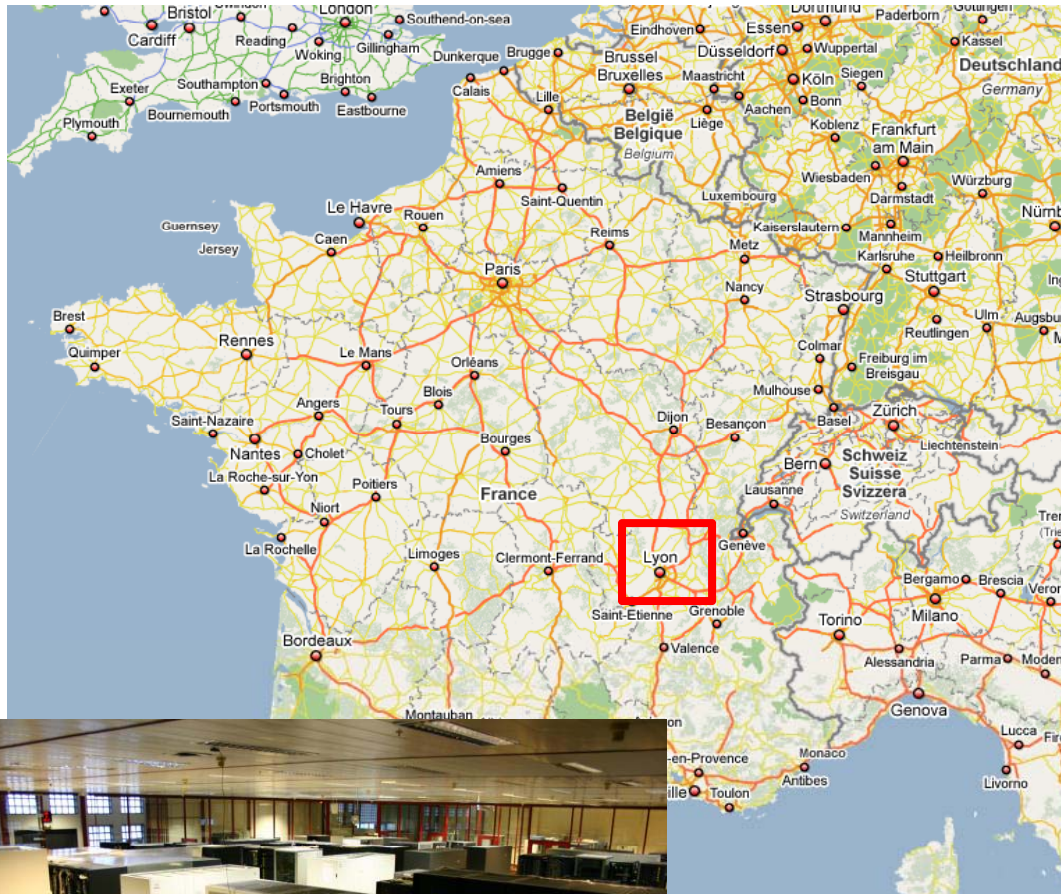
**(LHCOPN's part, now included, is in another talk)**

**Guillaume Cessieux (CNRS, IN2P3-CC)**
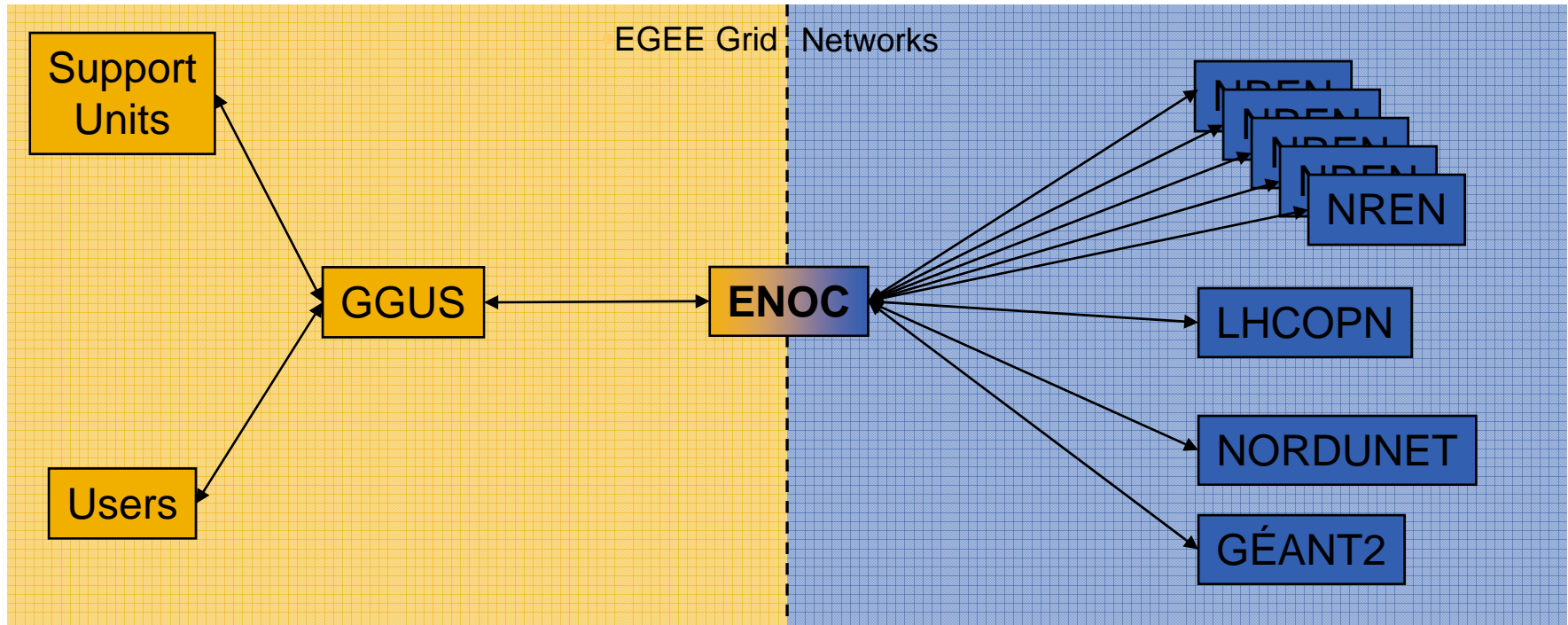
*SA2 Kickoff , Paris 2008-05-16*

**Enabling Grids for E-sciencE**







- Since 1986
- Now 70 persons
- 6k jobs running in //
- 20k jobs / day
- > 3800 cores
- Ranks 229 in TOP500 CC
- French LHC T1
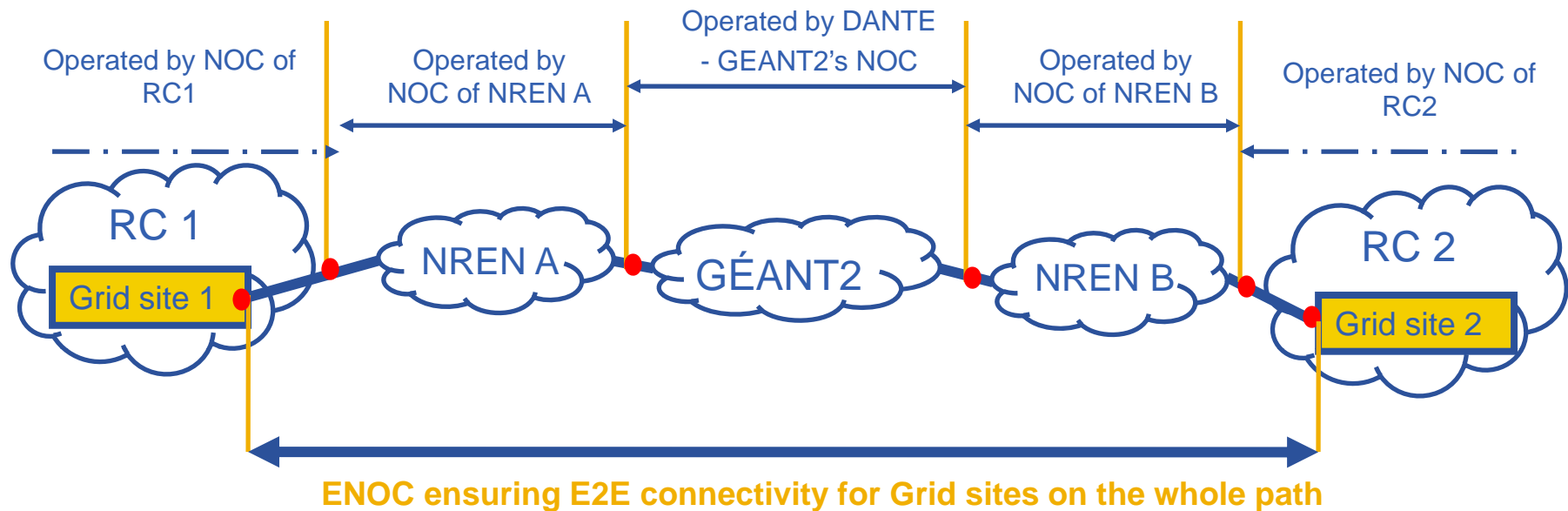
**Enabling Grids for E-sciencE**

- **History of the ENOC**

- **What is the ENOC now**
  – Roles
  – implementation

- **Current assessment of the ENOC**
  – Drawbacks
  – Achievements

- **The ENOC in EGEE-III**
  – Future plans

- **Conclusion**

**Enabling Grids for E-sciencE**

- **Idea of a project NOC raised during EGEE-I**

- **EGEE-I**
  - First process and possibilities studied
    - Tasks, actors, requirements
    - Interfaces and procedures
- **EGEE-II**
  - Concrete idea of what it should be
  - Implementation of the ENOC – EGEE Network operating centre - started from scratch May 2006

- **No other project's NOC known before…**
  - **Have to prove its usefulness and efficiency**

EGEE Grid | Networks

Support Units → GGUS
Users → GGUS
GGUS ↔ ENOC
ENOC → NREN, NREN, NREN, NREN, NREN
ENOC → LHCOPN
ENOC → NORDUNET
ENOC → GÉANT2

- **The ENOC acts as a single entry point**
  - ⇒ **From Grid to networks**
  - ⇐ **From networks to Grid**

Operated by NOC of RC1

Operated by NOC of NREN A

Operated by DANTE - GEANT2's NOC

Operated by NOC of NREN B

Operated by NOC of RC2

RC 1

Grid site 1

NREN A

GÉANT2

NREN B

RC 2

Grid site 2

**ENOC ensuring E2E connectivity for Grid sites on the whole path**

*This schema applies for "standard connectivity"*

( = outside of LHCOPN's scope or some sites accessed over the Internet)

NREN: National research and educational network (RedIRIS, SWITCH, DFN ...)

NOC: Network operation centre

ENOC: EGEE NOC

E2E: End to End

RC: Resource centre

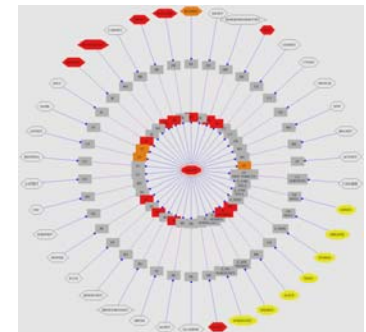● : Demarcation point

**Enabling Grids for E-sciencE**

- **Process information from networks**
  - Warn Grid about network related issues

- **Provide User support:**
  - Follow network issues raised by Grid users
  - End to End network support

- **Do all necessary into achieving that**
  - Relationships with network providers
  - Tools, procedures (Grid & networks)
  - ...

- **Why?**
  - Nearly sole information from networks
    - Standard network monitoring not achievable on EGEE scope
      - *PerfSONAR, SNMP, etc.*
    - Networks tickets
      - *Incident (~59%)*
      - *Maintenance (planned) (~41%)*

- **Filter and compute it**
  - Impact on the Grid ?
    - Discard wifi outages, satellite links down etc.
  - Grid sites impacted
    - Names, time windows, severity

- **Broadcast and track relevant troubles**
  - Synchronisation with GGUS
  - Automatically warn when solved, delayed, cancelled etc.

- **3 hosts @CC-IN2P3, FR Lyon – Telecom array - HA**
  - 1 production (httpd, cron, stats, monitoring, db…) - ccenoc
  - 1 test & long term database storage - ccsa2mon
  - 1 LHCOPN (shared – perfSONAR) – cclhcopnmon
  - (1 VM for perfSONAR testing)
- **Red Hat, mySQL, PHP (90%), python**
- **Databases**
  - Topology (445 domains, 1k endpoints, 680 links)
  - Trouble tickets (60k e-mails, 16k TT, 500MB)
  - Monitoring (300MB/Day)
    - 1600 hosts polled every 2 minutes
- **A bunch of tools is available through the webinterface**
  - https://ccenoc.in2p3.fr [Authentication with certificate]

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Enabling Grids for E-sciencE

### Topology

- NODfiller
- PathFinder
- TTdraw
- TTdraw light

### Internal

- Access Manager
- PhpMyAdmin
- ENOC's Heart
- AWstats
- Mrtg CCENOC
- DBschema
- TTstats

### Collaborative

- Wiki
- CVS Web
- Σ DMS

### Networks

- LHCOPN Looking Glass
- Looking Glass
- ASPDrawer
- DownCollector

- TTlookv2
- TTlook
- TTlinker
- TTtracker

### TTfilter

### Trouble Tickets handling

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**Enabling Grids for E-sciencE**

**Number of connectivity troubles detected on EGEE Grid certified sites sorted per supposed location**



Legend:
- WAN/MAN
- LAN / Non network (power...)
- Unknown
- Number of sites with at least one network trouble
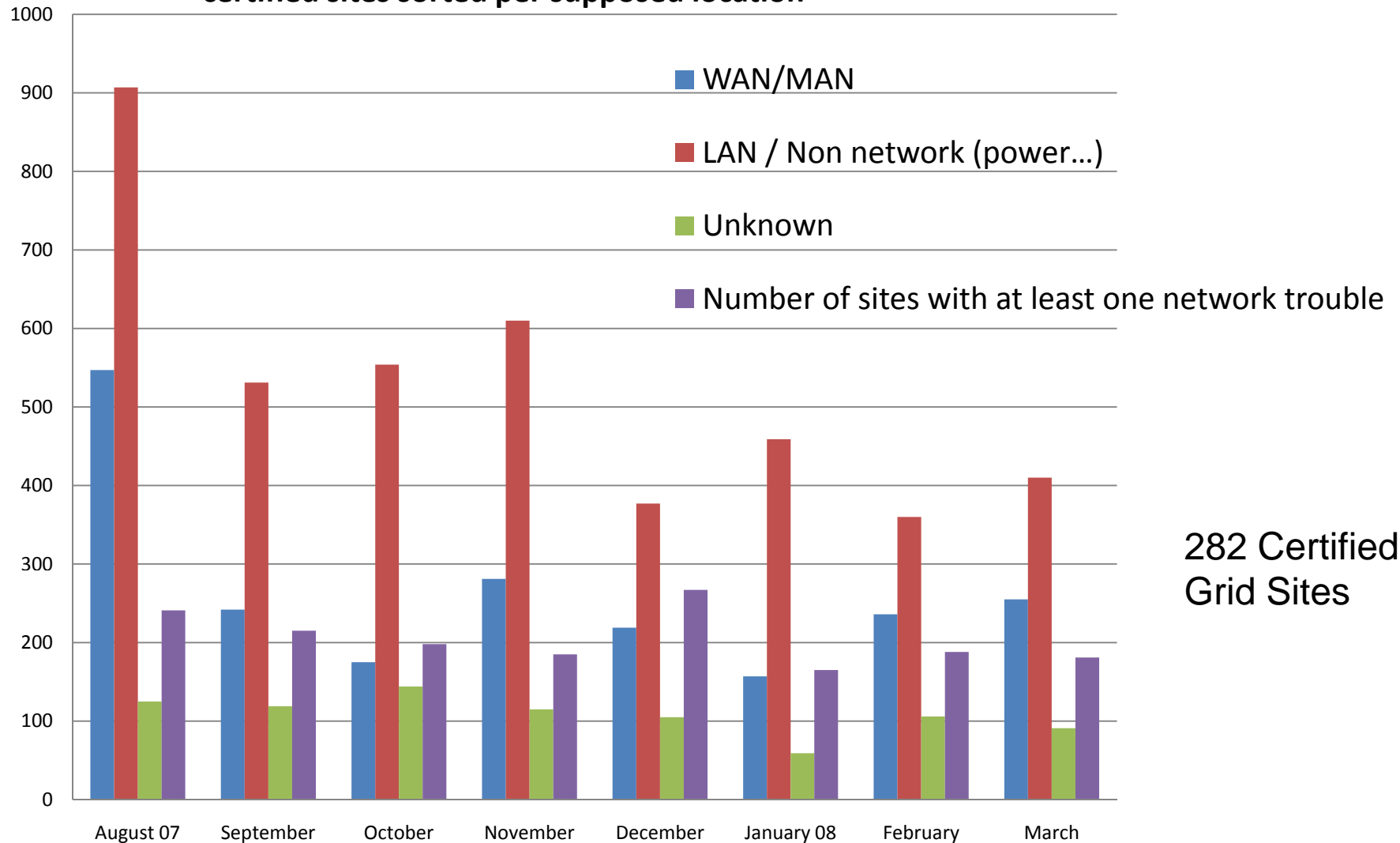
282 Certified Grid Sites

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Usage of webserver on ccenoc.in2p3.fr

![egee logo] **Enabling Grids for E-sciencE**



**DB entries**

**SQL queries**

**CPU**

**GGUS tickets**

**Tickets processing**
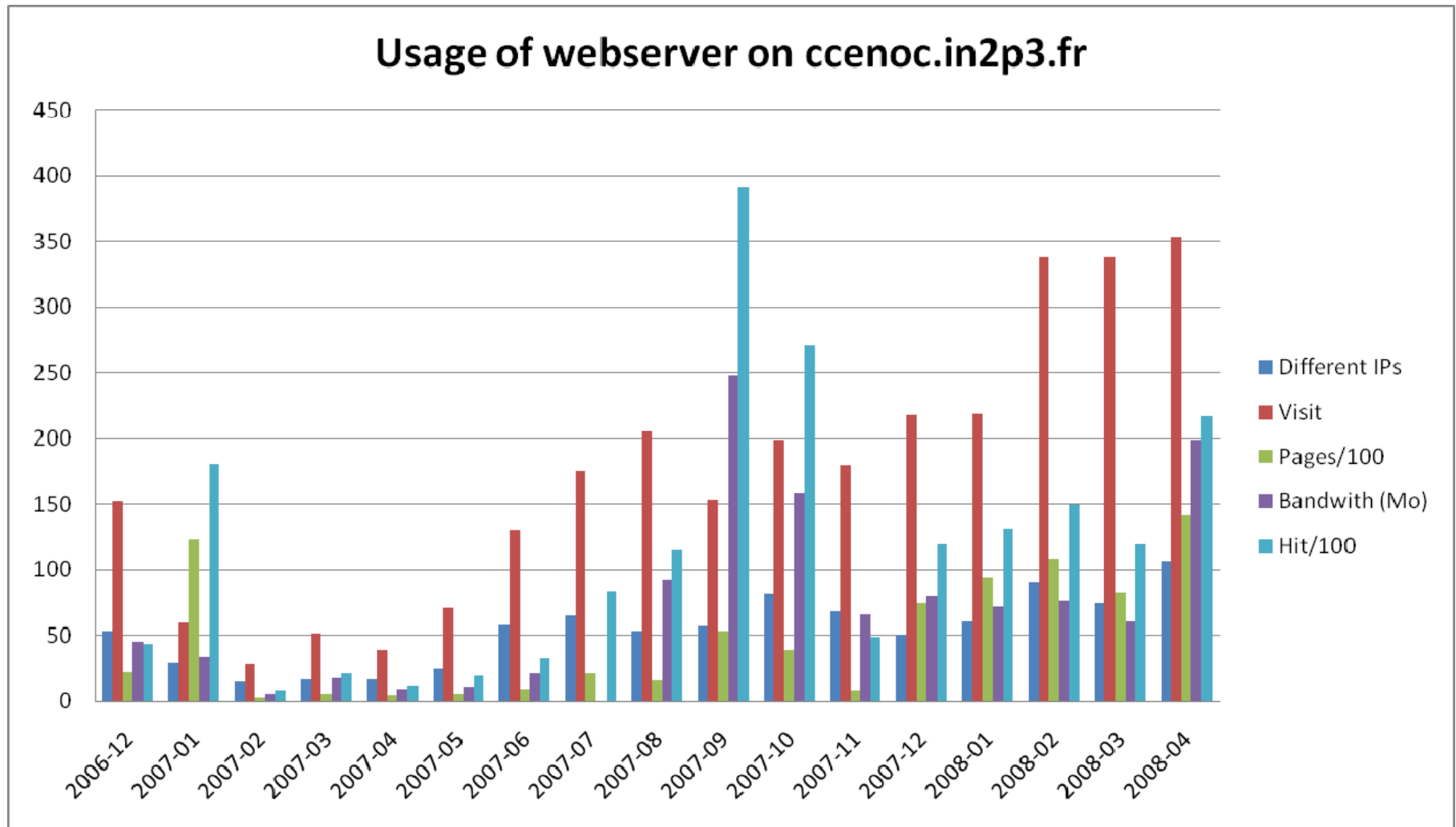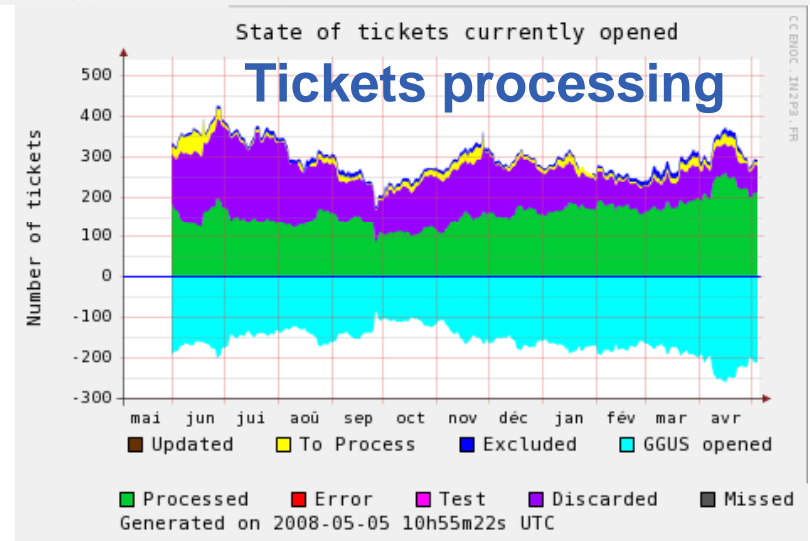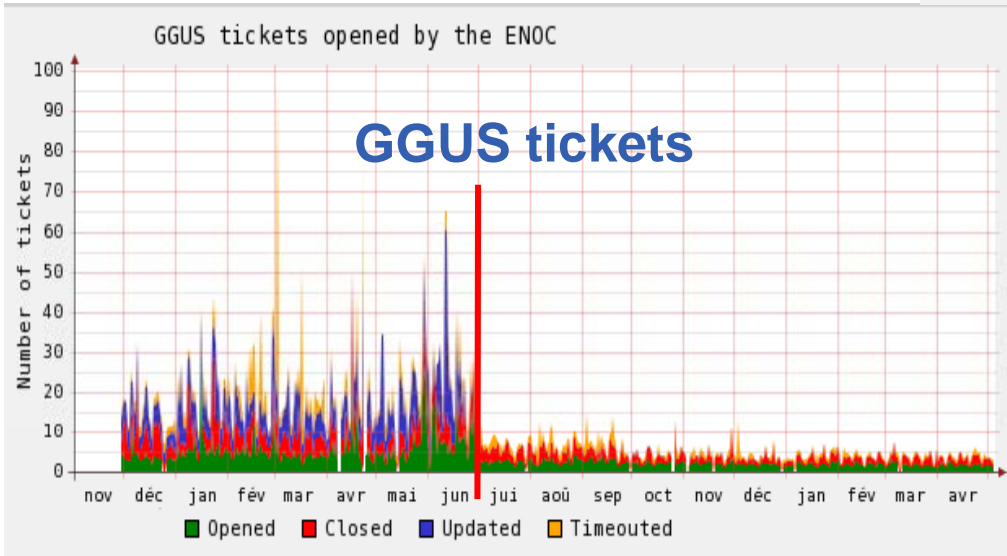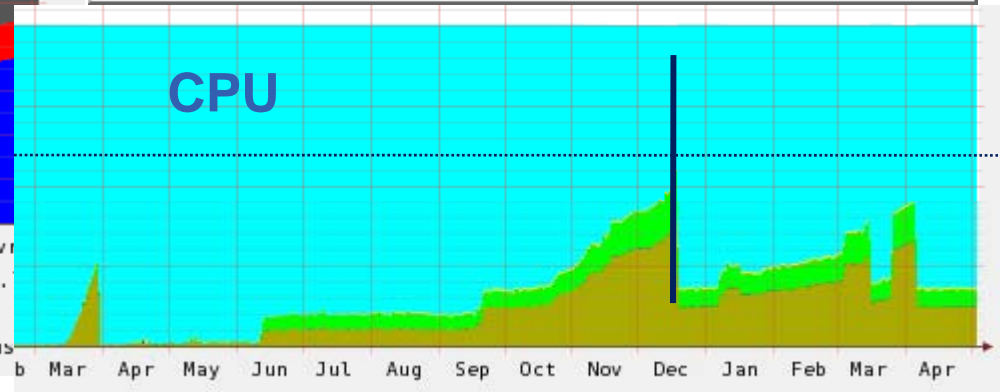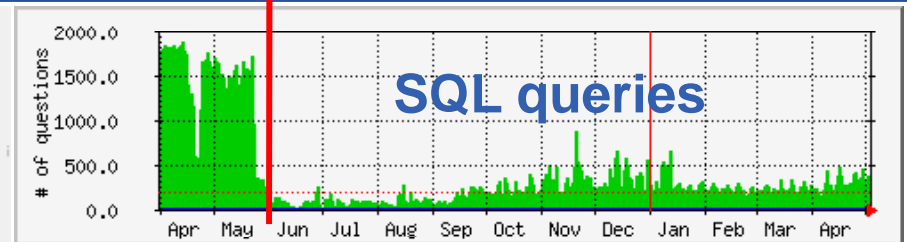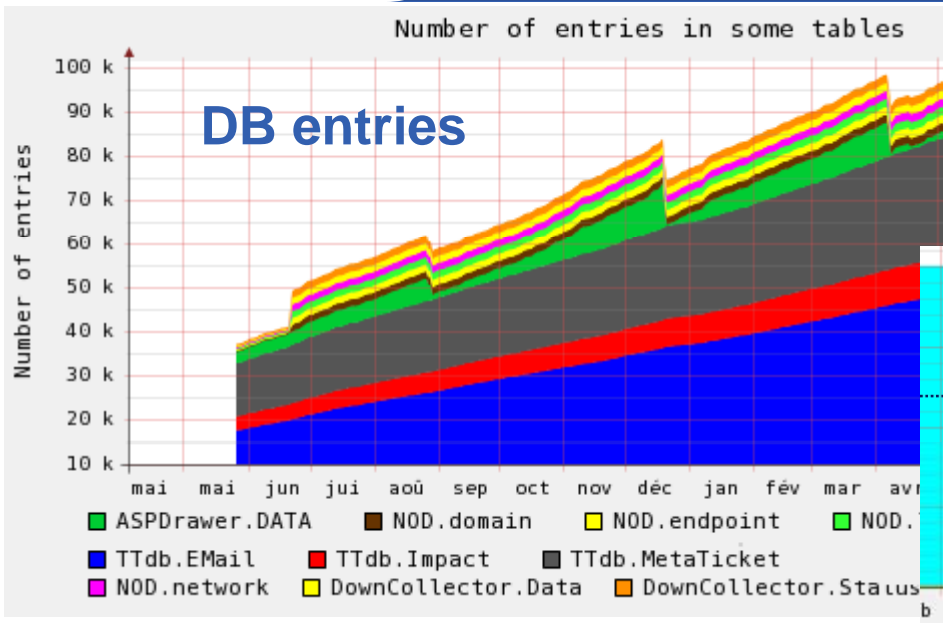
1. **DownCollector**
   - ~8k pages/month from COD dashboard
   - 130k hits(380Mo)/month from Nagios sensors

2. **ASPDrawer**
   - LHCOPN L3 monitoring

3. **TTdrawlight**
   - Network troubles tickets mapped on Grid topology

- **Focus is on improving these tools and the information they deliver**

**Enabling Grids for E-sciencE**

- **EGEE user support: Network support unit**
  - Network problems hidden or not raised by Grid users
  - Very few tickets to process in this way

- **Monitoring / troubleshooting**
  - Not sufficient but hard to endorse for better
  - Hard to troubleshoot network problems

- **Automatic impact assessment from trouble tickets**
  - Raw, too many tickets pushed to the Grid
  - But compulsory regarding the heavy workflow (700 TT/month)
- **Metrics**
  - Not meaningful… hard to quantify work done by the ENOC

**Enabling Grids for E-sciencE**

- **Monitoring**
  - Not yet wonderful but good step ahead provided by DownCollector

- **Strong integration within Grid Operations**
  - GGUS (still 10k tickets handled … good but too much)
  - CIC portal & COD dashboard (EGEE-SA1)
    - Better incoming

- **Relationships with NRENs**
  - Trouble tickets exchange, storage and use by the ENOC
    - 2k e-mails/ month , ~ 700 TT / month
  - 18 networks providers send theirs TT
    - 75% of EGEE certified sites covered (about 90% of European)

**Enabling Grids for E-sciencE**

- **Monitoring**
  - Solution needed, but it will finally ensure only troubleshooting
  - **Addressed by DFN**

- **Trouble tickets exchange standard**
  - Format and exchange methods
    - Also « harmonization of content »?
  - **Could solve a lot of issues for the ENOC = key dependancy**
  - **Addressed by GRNET**

- **New approach**
  - Start from troubles experienced on the Grid
  - Better trouble management
  - **Adressed by RRC-KI**

- **Focus set on**
  - Accuracy and usefulness
  - Grid usability of information delivered

**Enabling Grids for E-sciencE**

*(From DoW)*

- **Task TSA2.1: ENOC running**
  - (Daily user support within GGUS)
  - LHCOPN support
  - Trouble ticket exchange and exploitation

- **Task TSA2.2: Support for the ENOC**
  - Operational procedures: updates and improvements
    - Relationships with network providers and clients
  - operational tools
    - Maintain, update, improve
    - Driven by automation AFAP
    - Monitoring

**Enabling Grids for E-sciencE**

- ## DSA2.1: Status of the ENOC, due PM 11
  - This deliverable will describe the status of the ENOC according to the plans and metrics described in MSA2.3.1

- ## DSA2.2: Assessement of the ENOC, due PM 20
  - This deliverable will assess the status of the ENOC according to the plans and metrics described in MSA2.3.1 and MSA2.3.2

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Enabling Grids for E-sciencE

## SA2 – EGEE-III

**ENOC running**

**Support for the ENOC**

**Operational procedures (CNRS)**

**LCG Support (CNRS)**

**Operational tools and maintenance (RRC-KI, CNRS)**

**Monitoring (DFN)**

**Troubleshooting (DFN)**

**Site networking needs (RedIRIS)**

**Overall Networking coordination**

**IPv6 (GARR, CNRS)**

**TT exchange standard (GRNET)**

**Advanced network services (GRNET)**

**TNLC**

**Enabling Grids for E-sciencE**

- **ENOC tasks split and distributed**
  - More partners involved
  - Several <u>key</u> work packages to really enhance current implementation
  - Mix everything all together

- **Achievements needed before next two years**
  - No extra delay!

- **Not yet idea on how this could/should fit within EGI**

# Question/Comment?