LHCOPN operational model

Guillaume Cessieux (CNRS/FR-CCIN2P3, EGEE SA2)
On behalf of the LHCOPN Ops WG

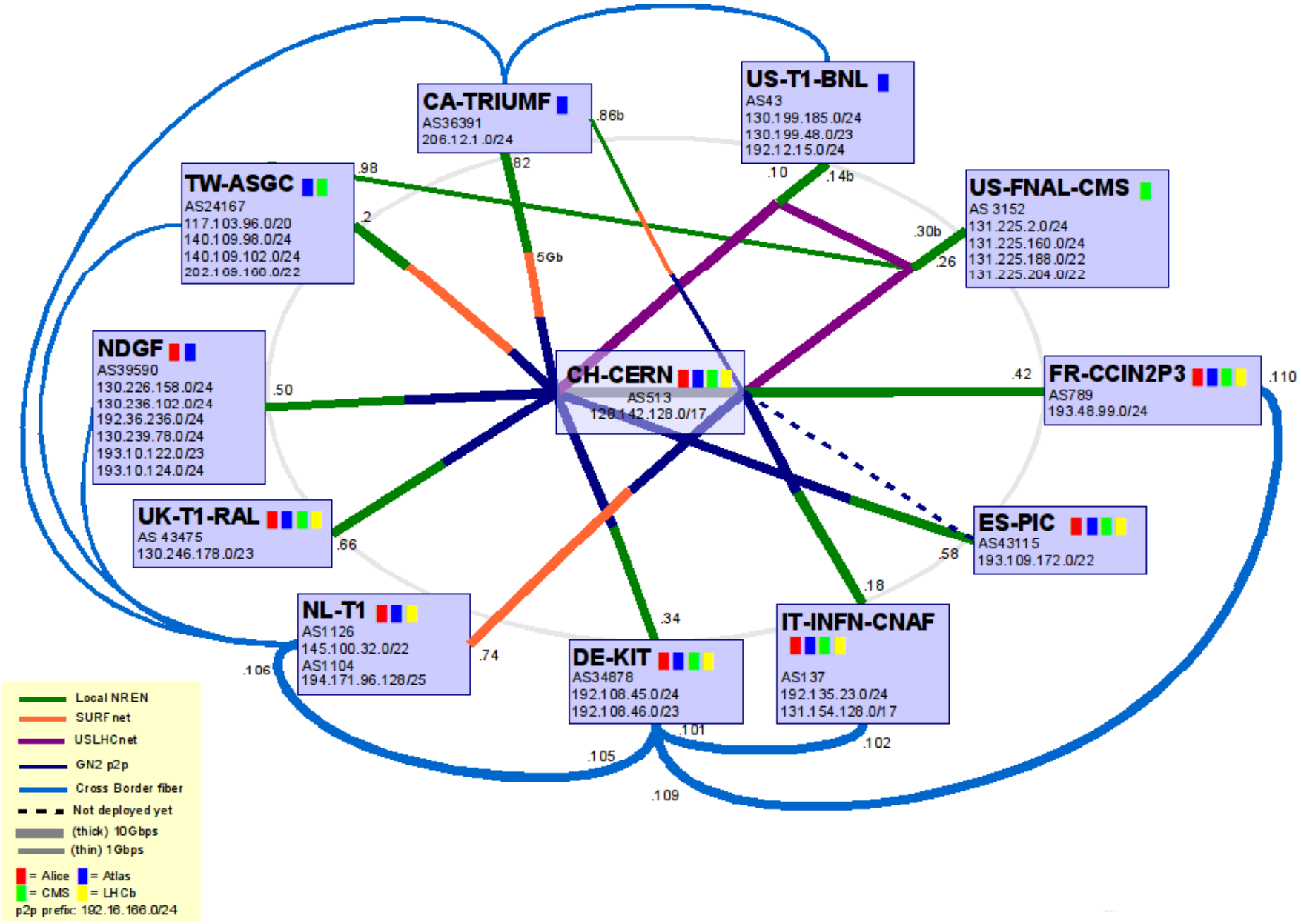
GDB

CERN – November 12th, 2008

Outlines

- LHCOPN network operational model
  - Status
  - Overview
- How to fit with Grid operations
  - Focus on Grid data manager role

Infrastructure status



Courtesy of Edoardo Martelli – CERN – 2008-07-08

Particularities

- Multi-domain and layered network
  - 12 sites (T0/T1s) managing IP layer
  - ~ 15 networks providers delivering 30 end to end circuits (L2 lightpaths)

- Standard (NREN-IP) network operational model not suitable
  - Sites key part of the network
  - Network providers have no view and are not responsible for the L3 service

Ops model background

- Federated vs centralised approach
  - E2ECU, L3NOC, LCU, ENOC, DANTE…
  - Previously much divergence
- Centralised one not fitting with sites processes
  - Communication overhead…
- Federated model preferred
  - But robustness to be ensured

Design process

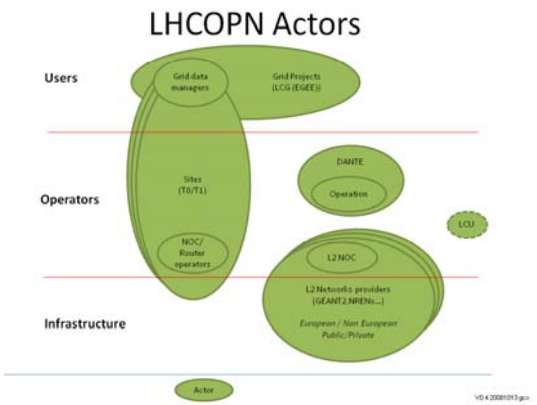
- New Ops WG set up to produce it (2008-06)
  - 11 people: 1 NREN, 5 sites, DANTE, EGEE
- Strong effort on how to document
  - The strict minimum … but accurate enough
- Formalise roles and responsibilities
  - Separate design from implementation

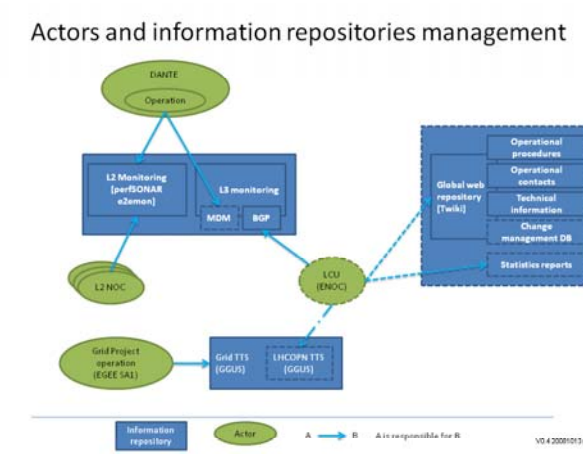
Current status

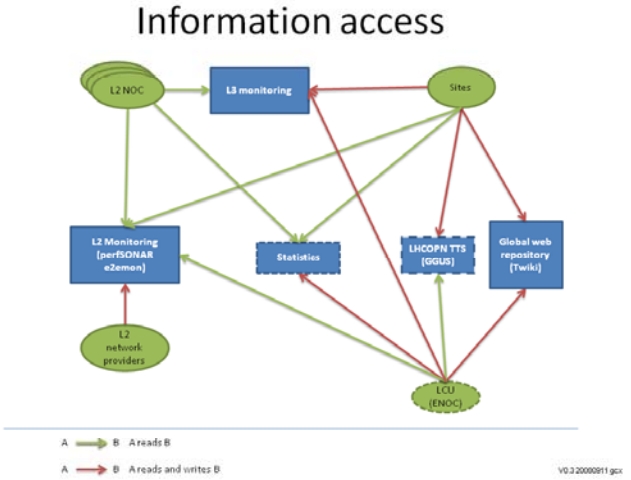
- No operational model currently in place
- Concrete model elaborated and proposed - 2008-10
- Full version published on twiki!
  - https://twiki.cern.ch/twiki/bin/view/LHCOPN/OperationalModel
  - Backup tests processes also addressed
- Proposal being reviewed by sites' networks teams

Structure of the Ops model (1/2)

- Foundation
  - Actors
  - Information repository management
  - Information access

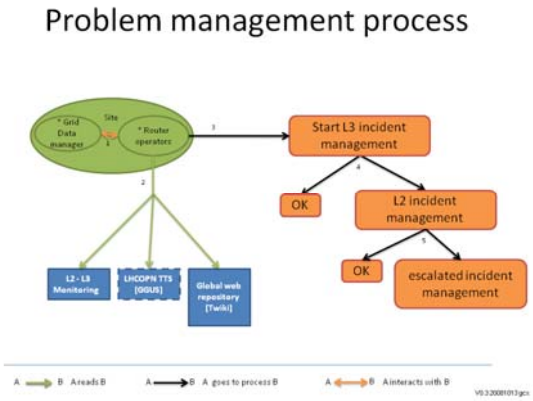


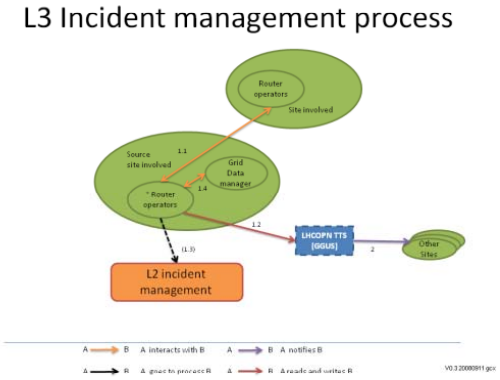


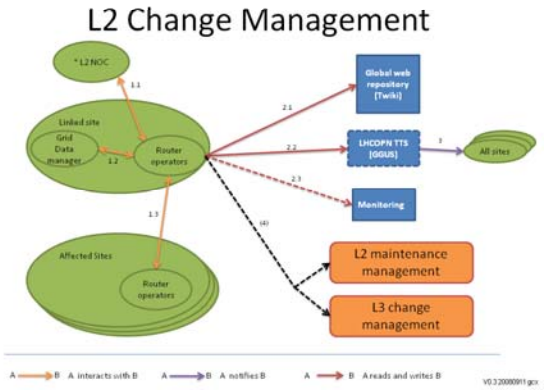


Structure of the Ops model (2/2)

- Processes
  - Incident management (L2, L3 and escalation process)
  - Change management (L2, L3)
  - Maintenance management (L2, L3)





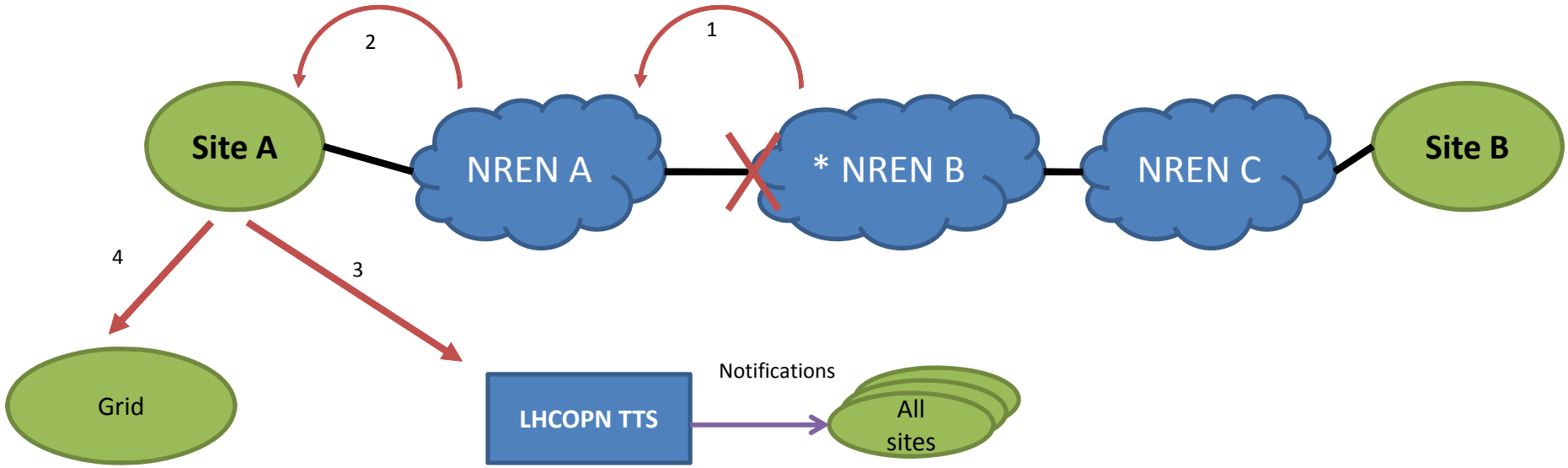


Overview of the Ops model

- Federated model with **key responsibilities on sites**
  - Interaction with network providers
  - Management of network devices on sites
  - Interaction with the Grid

- Information centralised: TTS & Twiki
  - serialize, track and advertise trouble management
  - Contacts, technical details, etc.

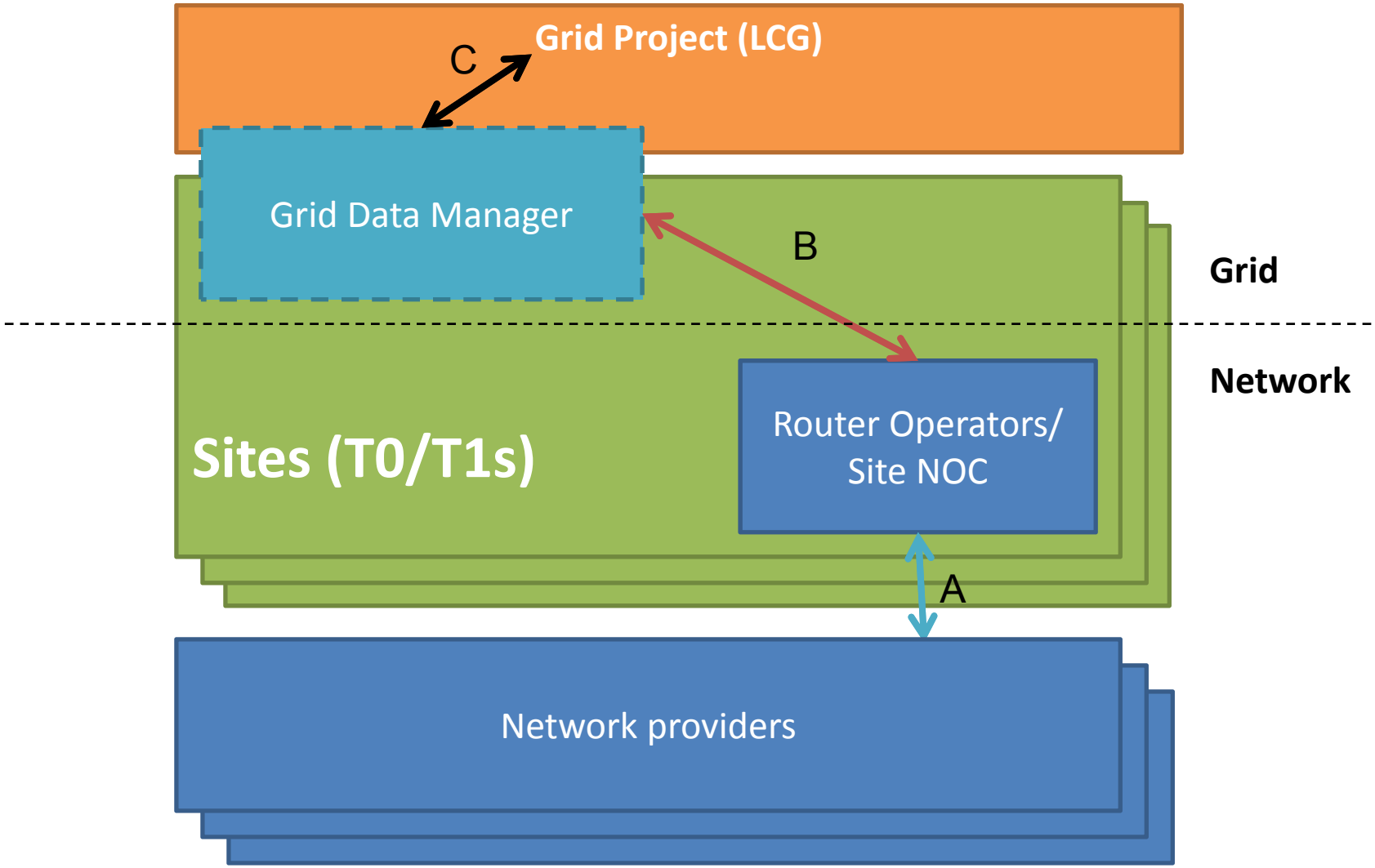
Global workflow



– Delay and reliability of the propagation

\+ The way it currently works!

Proposed site implementation



Router Operators - RO

- Existing and identified on sites
  - People managing network devices
- Interaction with network providers
  - Customer ↔ Service provider relationship!
- Create and update TT in the LHCOPN TTS
  - Global information repository
- Interact with local Grid data manager

Grid data managers - GDM

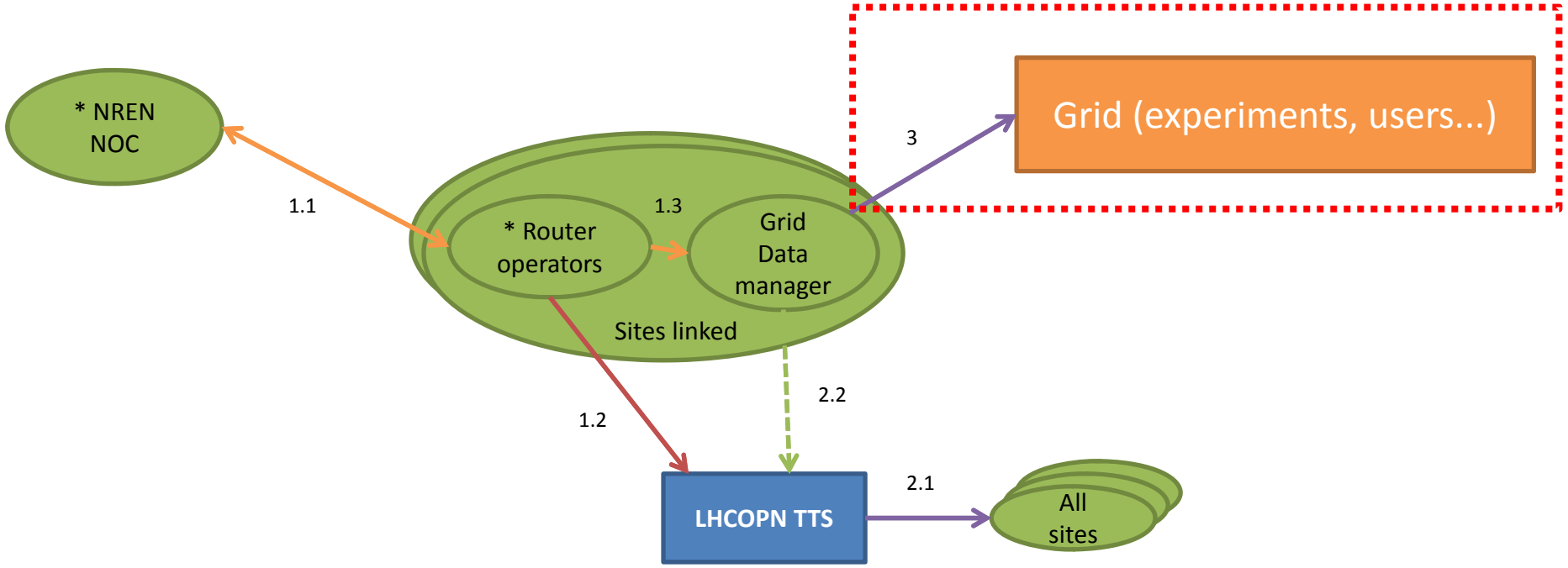
- Generic role in charge of interactions with Grid operations
  - Not yet existing?
  - Impact assessment and broadcasting
- People managing data transfers
  - Main users of the LHCOPN
- Strong interactions with router operators
  - Proximity: One per site
  - Read Only access to the LHCOPN TTS

RO ↔ GDM interactions

- Grid to Network (= GDM → RO)
  - Submit LHCOPN problem
- Network to Grid (= RO → GDM)
  - Inform about problems, scheduled troubles and infrastructure changes
- Details part of internal sites' processes
  - Flexibility for implementation

Sample process: Dark fibre outage

(L2 incident management process)



A → B A interacts with B

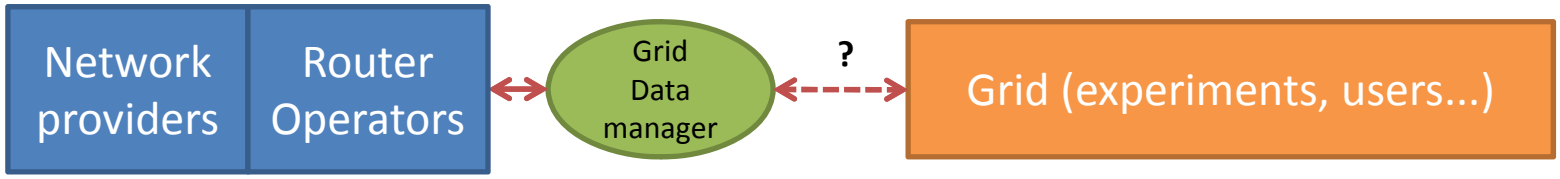
A → B A notifies B

A → B A reads and writes B

A → B A reads B

Interactions with Grid operations

- Not yet defined
  - Only through Grid data managers input/output points
  - What should they next do for the Grid?



- Support structure still in place to be used?
  - Sustainability, implementation, manpower, tools...

The LHCOPN TTS

- Helpdesk within GGUS
  - Provided by EGEE-SA1
- Dedicated and isolated helpdesk tailored for LHCOPN router operators
- Information access policy
  - Tickets read only for anyone authenticated
  - **Only router operators to act on them**

Submit form

Work ongoing

Submit OPN ticket

User information

Name	Guillaume Cessieux	E-Mail	guillaume.cessieux@cc.in2p3
CC to ?		Notification mode ?	○ on every change ◉ on solution

Problem information

Problem Start Date	2008 - 11 - 12 / 08 : 24 UTC
Problem End Date	- - - / : UTC
Ticket Category	Incident L2
Priority	urgent
Short description (required)	Dark fibre cut between CH-CERN and DE-KIT
Describe your problem providing the information listed here ?	DE-KIT reached through FR-CCIN2P3. DFN investigation ongoing (TT #DFN-1-4D0D4S).

Impacted sitenames

☑ CH-CERN	☑ FR-CCIN2P3	☐ TW-ASGC
☐ CA-TRIUMF	☐ IT-INFN-CNAF	☐ UK-T1-RAL
☑ DE-KIT	☐ NDGF	☐ US-FNAL-CMS
☐ ES-PIC	☐ NL-T1	☐ US-T1-BNL

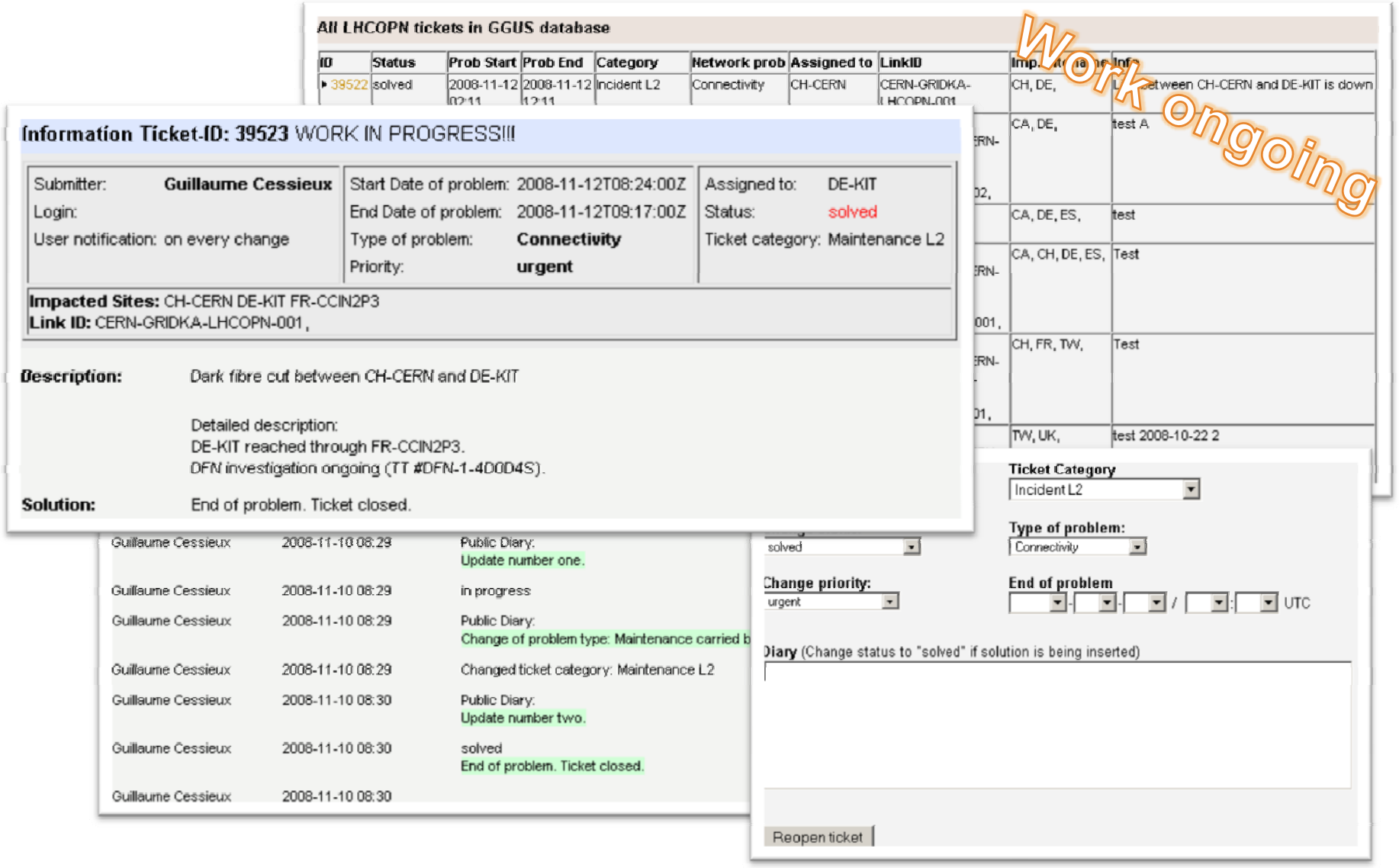
Link ID

- CERN-FERMI-LHCOPN-001
- CERN-FERMI-LHCOPN-002
- CERN-GRIDKA-LHCOPN-001
- CERN-IN2P3-LHCOPN-001
- CERN-PIC-LHCOPN-001

Type of network problem	Connectivity	Assign it to	DE-KIT

Submit LHCOPN ticket

Ticket view & history / Update/ Dashboard



Remaining work

- Ops model implementation details
  - Authentication, communication channels, etc.
  - Quality assessment
    - Network (MoU metrics checking...) and processes
  - Dependency: Monitoring - perfSONAR based
    - L3: DANTE – packaged MDM appliances shipped on sites
    - L2: DANTE & NRENs - e2emon deployed
- **Grid interactions:** Grid data managers
  - Define and document role and responsibilities

Conclusion

- Networks operations converging to a consensus around the federated model
  - Target for first implementation: End of January 09
- Grid interactions to be clearly defined
  - Through the Grid data manager role
    - Who, what, when, how

Main questions

- Do you agree with this model?
- Who are Grid data managers?
- What will they do for the Grid?

Discussion