

LHCOPN operational model

Guillaume Cessieux (CNRS/FR-CCIN2P3, EGEE SA2)

On behalf of the LHCOPN Ops WG

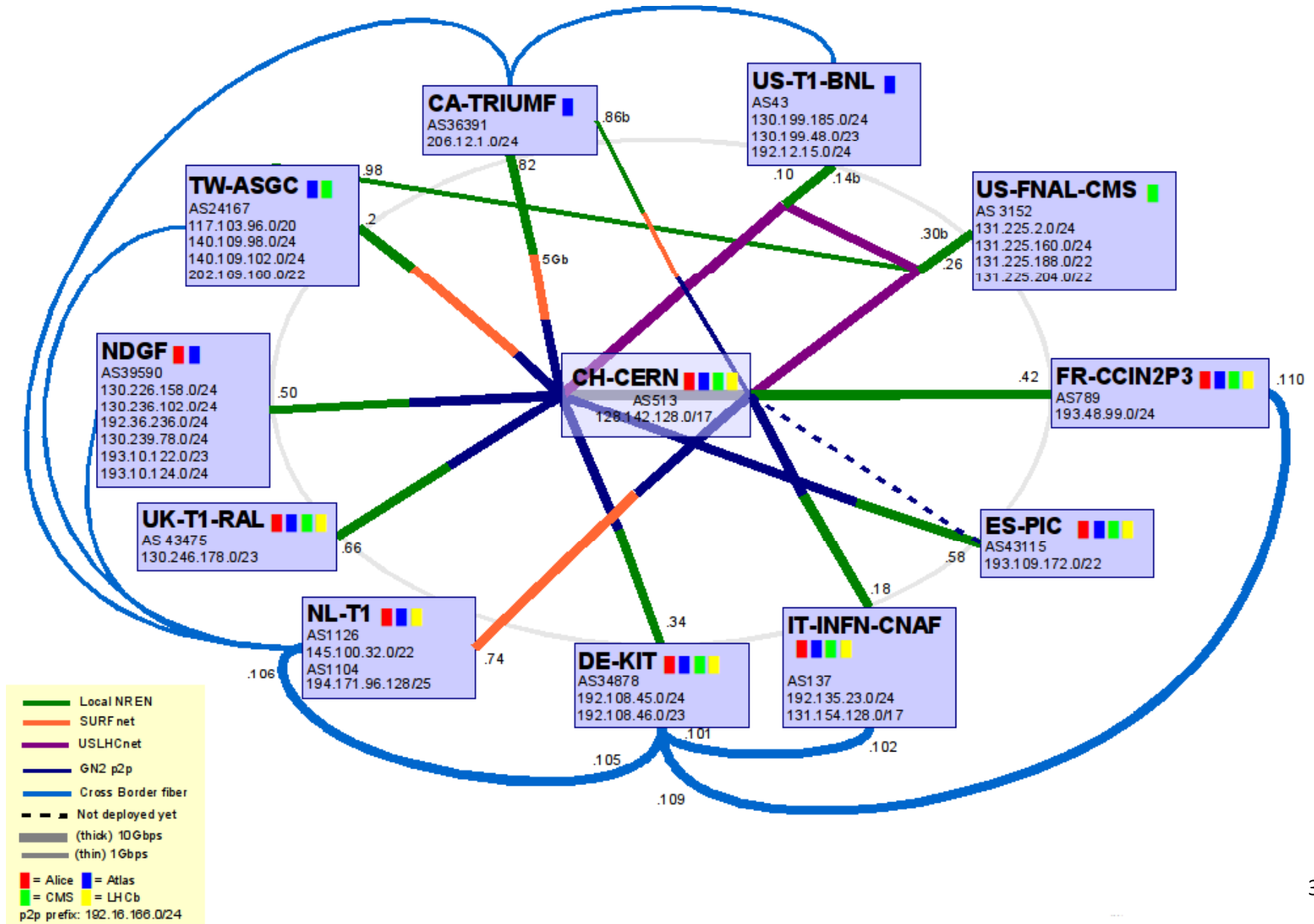
GDB

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

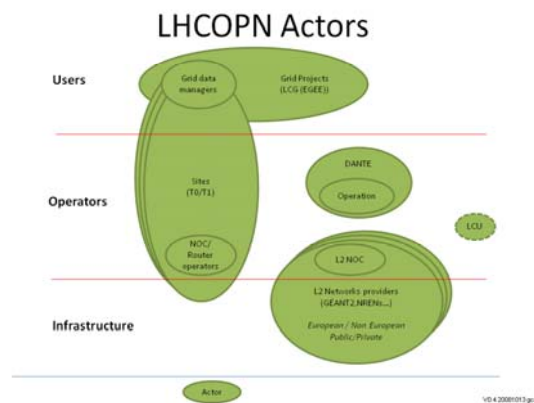
- New Ops WG set up to produce it (2008-06)
 - 11 people: 1 NREN, 5 sites, DANTE, EGEE
- Strong effort on how to document
 - The strict minimum ... but accurate enough
- Formalise roles and responsibilities
 - Separate design from implementation

Current status

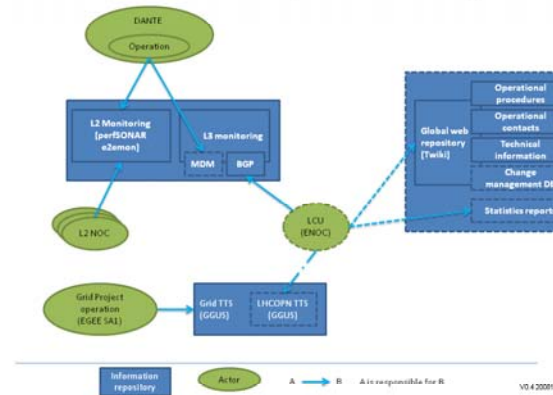
- No operational model currently in place
- Concrete model elaborated and proposed - 2008-10
- Full version published on twiki!
 - <https://twiki.cern.ch/twiki/bin/view/LHCOPN/OperationalModel>
 - Backup tests processes also addressed
- Proposal being reviewed by sites' networks teams

Structure of the Ops model (1/2)

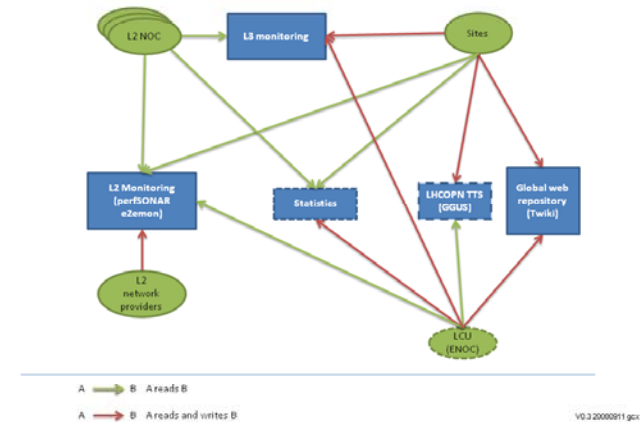
- Foundation
 - Actors
 - Information repository management
 - Information access



Actors and information repositories management



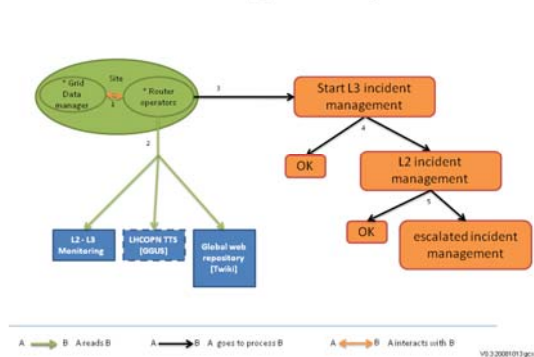
Information access



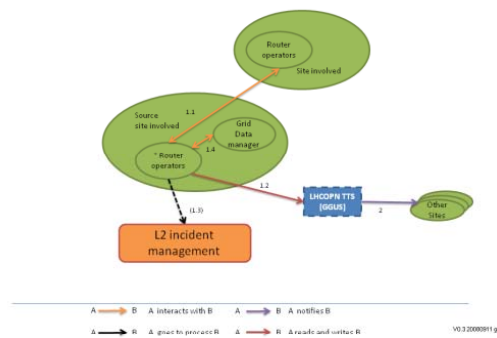
Structure of the Ops model (2/2)

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

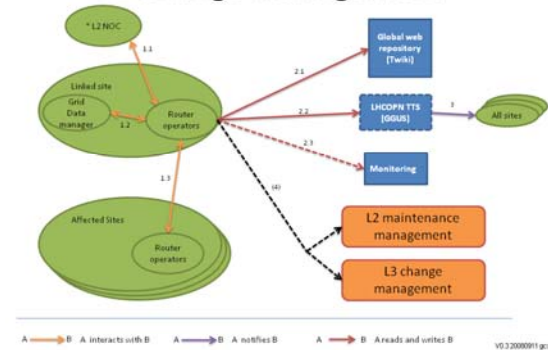
Problem management process



L3 Incident management process



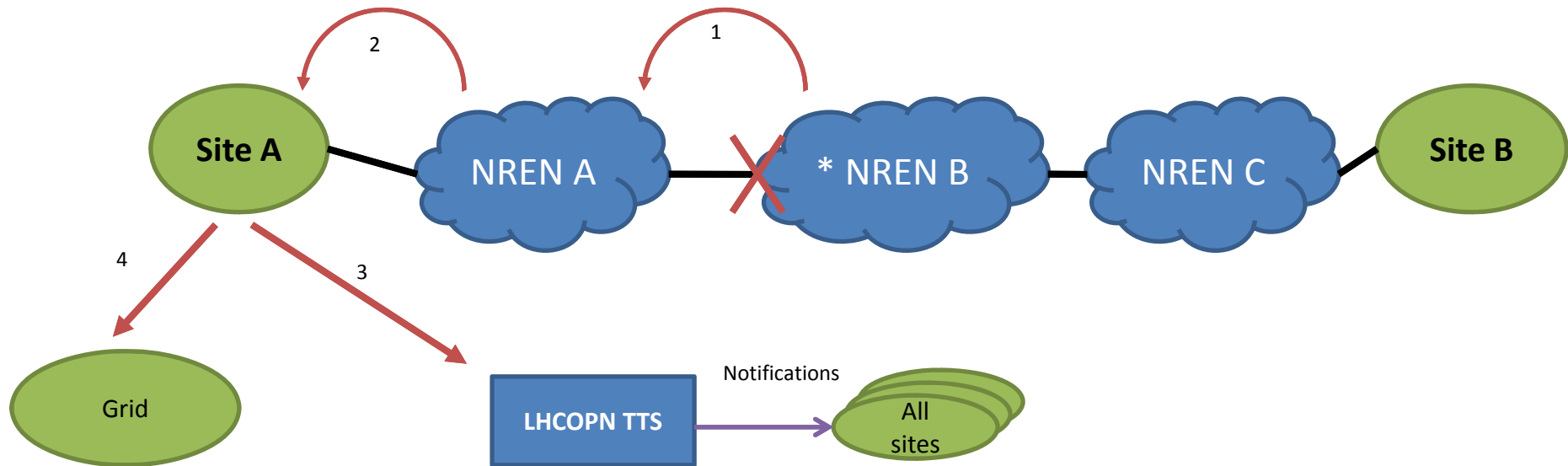
L2 Change Management



Overview of the Ops model

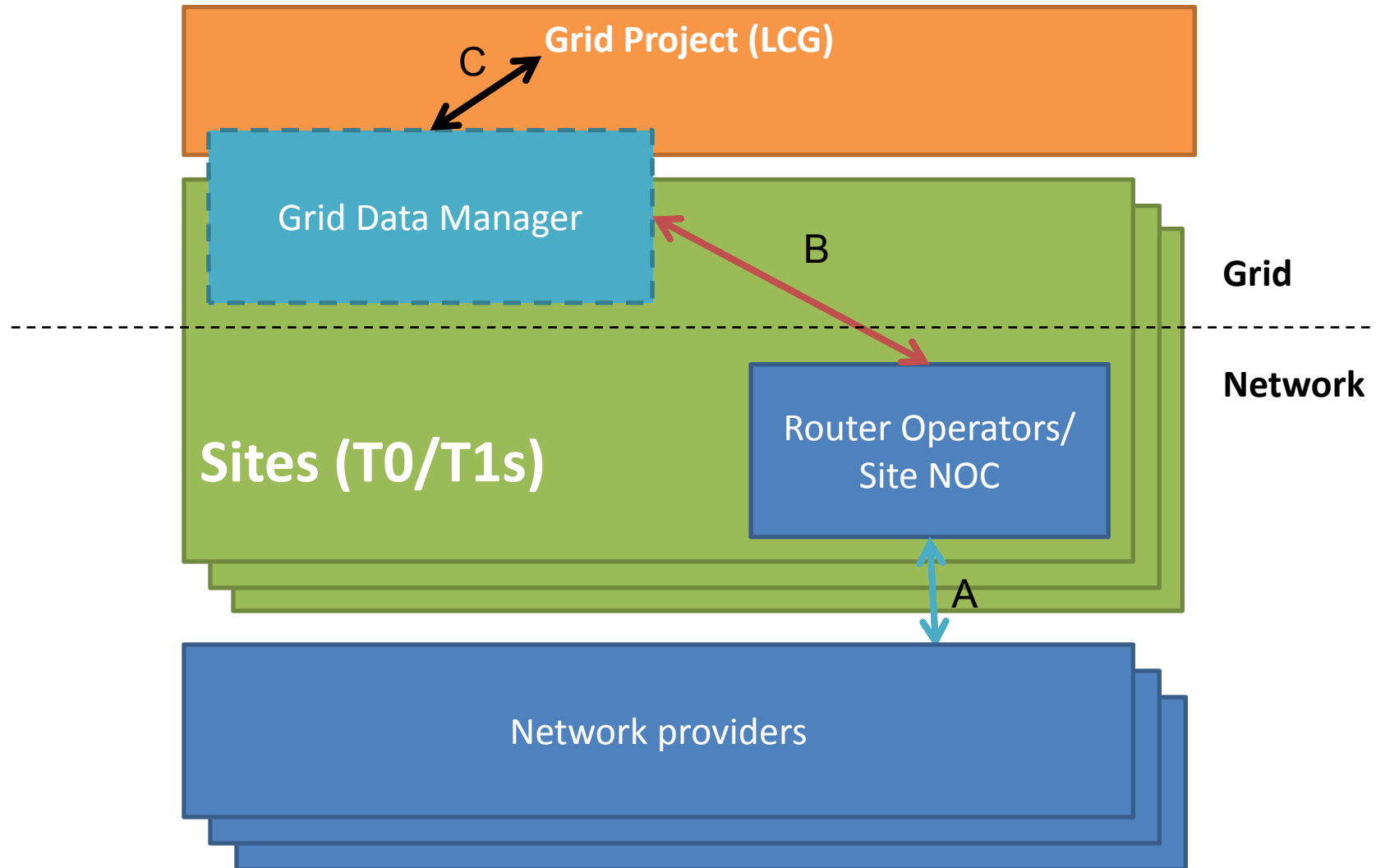
- Federated model with **key responsibilities on sites**
 - Interaction with network providers
 - Management of network devices on sites
 - Interaction with the Grid
- Information centralised: TTS & Twiki
 - serialize, track and advertise trouble management
 - Contacts, technical details, etc.

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

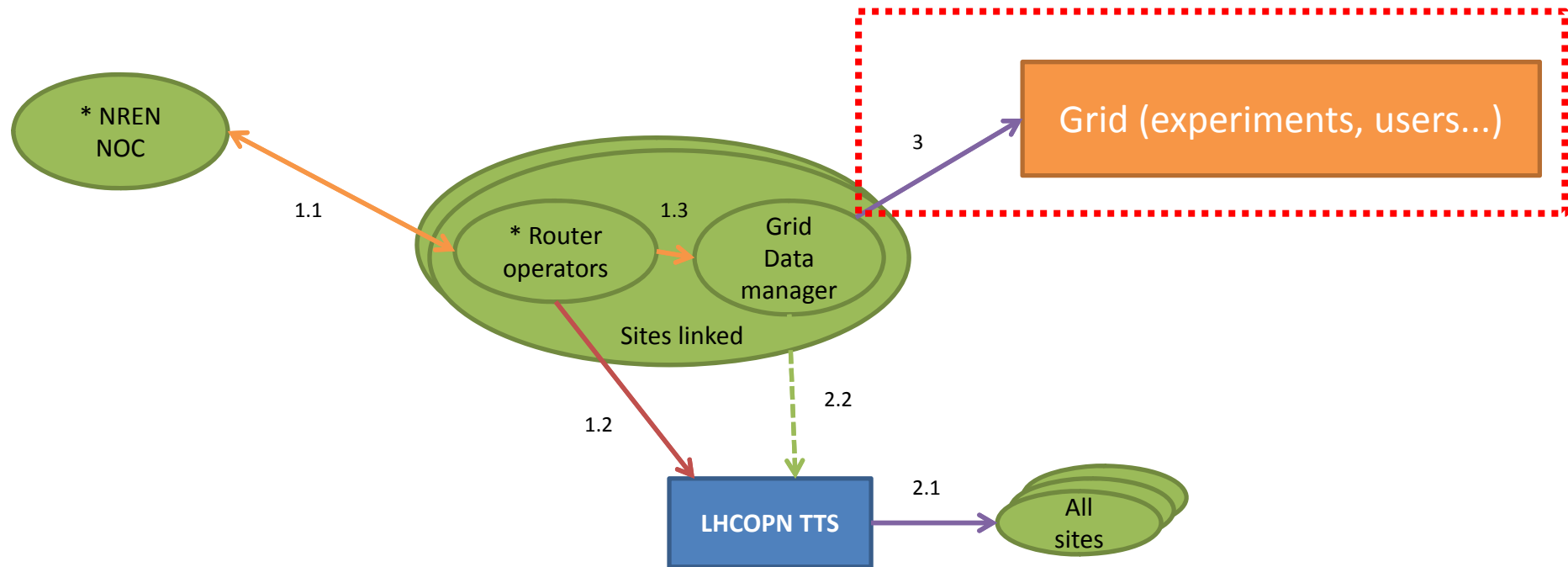
- Generic role in charge of interactions with Grid operations
 - Not yet existing?
 - Impact assessment and broadcasting
- People managing data transfers
 - Main users of the LHCOPN
- Strong interactions with router operators
 - Proximity: One per site
 - Read Only access to the LHCOPN TTS

RO \leftrightarrow GDM interactions

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

Sample process: Dark fibre outage

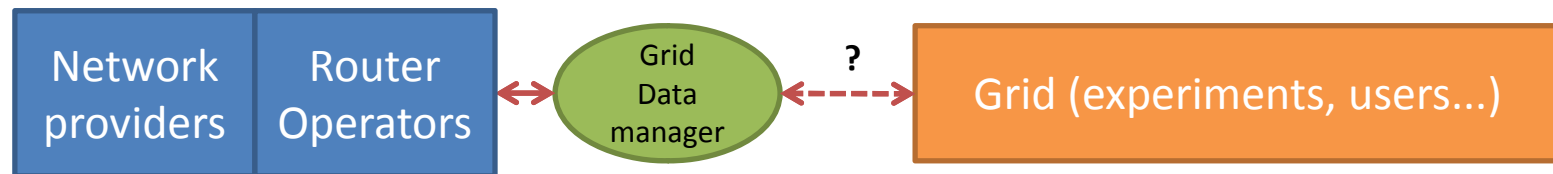
(L2 incident management process)



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 ?	<input type="text"/>	Notification mode ?	<input type="radio"/> on every change <input checked="" type="radio"/> 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

<input checked="" type="checkbox"/> CH-CERN	<input checked="" type="checkbox"/> FR-CCIN2P3	<input type="checkbox"/> TW-ASGC
<input type="checkbox"/> CA-TRIUMF	<input type="checkbox"/> IT-INFN-CNAF	<input type="checkbox"/> UK-T1-RAL
<input checked="" type="checkbox"/> DE-KIT	<input type="checkbox"/> NDGF	<input type="checkbox"/> US-FNAL-CMS
<input type="checkbox"/> ES-PIC	<input type="checkbox"/> NL-T1	<input type="checkbox"/> 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
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Submit LHCOPN ticket

Ticket view & history / Update/ Dashboard

All LHCOPN tickets in GGUS database

ID	Status	Prob Start	Prob End	Category	Network prob	Assigned to	LinkID	Impacted sites	Info
39522	solved	2008-11-12 02:11	2008-11-12 12:11	Incident L2	Connectivity	CH-CERN	CERN-GRIDKA-LHCOPN-001	CH, DE,	Link between CH-CERN and DE-KIT is down
								CA, DE,	test A
								CA, DE, ES,	test
								CA, CH, DE, ES,	Test
								CH, FR, TW,	Test
								TW, UK,	test 2008-10-22 2

Work ongoing

Information Ticket-ID: 39523 WORK IN PROGRESS!!!

Submitter: Guillaume Cessieux Login: User notification: on every change	Start Date of problem: 2008-11-12T08:24:00Z End Date of problem: 2008-11-12T09:17:00Z Type of problem: Connectivity Priority: urgent	Assigned to: DE-KIT Status: solved Ticket category: Maintenance L2
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Impacted Sites: CH-CERN DE-KIT FR-CCIN2P3
Link ID: CERN-GRIDKA-LHCOPN-001,

Description: Dark fibre cut between CH-CERN and DE-KIT

Detailed description:
 DE-KIT reached through FR-CCIN2P3.
 DFN investigation ongoing (TT #DFN-1-4D0D4S).

Solution: End of problem. Ticket closed.

Author	Date	Diary
Guillaume Cessieux	2008-11-10 08:29	Public Diary: Update number one.
Guillaume Cessieux	2008-11-10 08:29	in progress
Guillaume Cessieux	2008-11-10 08:29	Public Diary: Change of problem type: Maintenance carried b
Guillaume Cessieux	2008-11-10 08:29	Changed ticket category: Maintenance L2
Guillaume Cessieux	2008-11-10 08:30	Public Diary: Update number two.
Guillaume Cessieux	2008-11-10 08:30	solved End of problem. Ticket closed.
Guillaume Cessieux	2008-11-10 08:30	

Ticket Category
 Incident L2

Type of problem:
 Connectivity

Change priority:
 urgent

End of problem
 / UTC

Diary (Change status to "solved" if solution is being inserted)

Reopen ticket

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