



RENATER

REseau NAtional de télécommunications
pour la Technologie l'Enseignement et la
Recherche

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Legal entity

- GIP: Groupement d'intérêt public
- Not for profit, Public,
- Members are public entities
 - Ministries (Higher Education and Research, Education)
 - CNRS, CEA, CNES, INRIA, INRA, INSERM, CIRAD, IRD, BRGM, CEMAGREF, ONERA
 - Universities (CPU)





Organization

- Staff headcount is ~ 38 , growing to 50, because of changes in the R&E system
- Staff located in Paris, Montpellier, Rennes and Grenoble
- Budget: ~ 22 M€
- Architecture: Leased dark fibers activated and operated by RENATER
- Main part is based on IRU, complemented by lease contracts.





Architecture

- Network is based on Pops (~ 50)
- 3 cities are considered as International gateways (Paris-1, Paris-2, Lyon, Marseille-2/MOLEN)
- 7 PoPs are located overseas
- CBF connected to Lyon, Strasbourg and Nancy (and possibly later to Perpignan, Nice, Grenoble/Modane and Lille)





Architecture

- DWDM vendors: Alcatel-Lucent and CIENA
- L2/L3: CISCO, JUNIPER, BROCADE
- 10G lambda standard

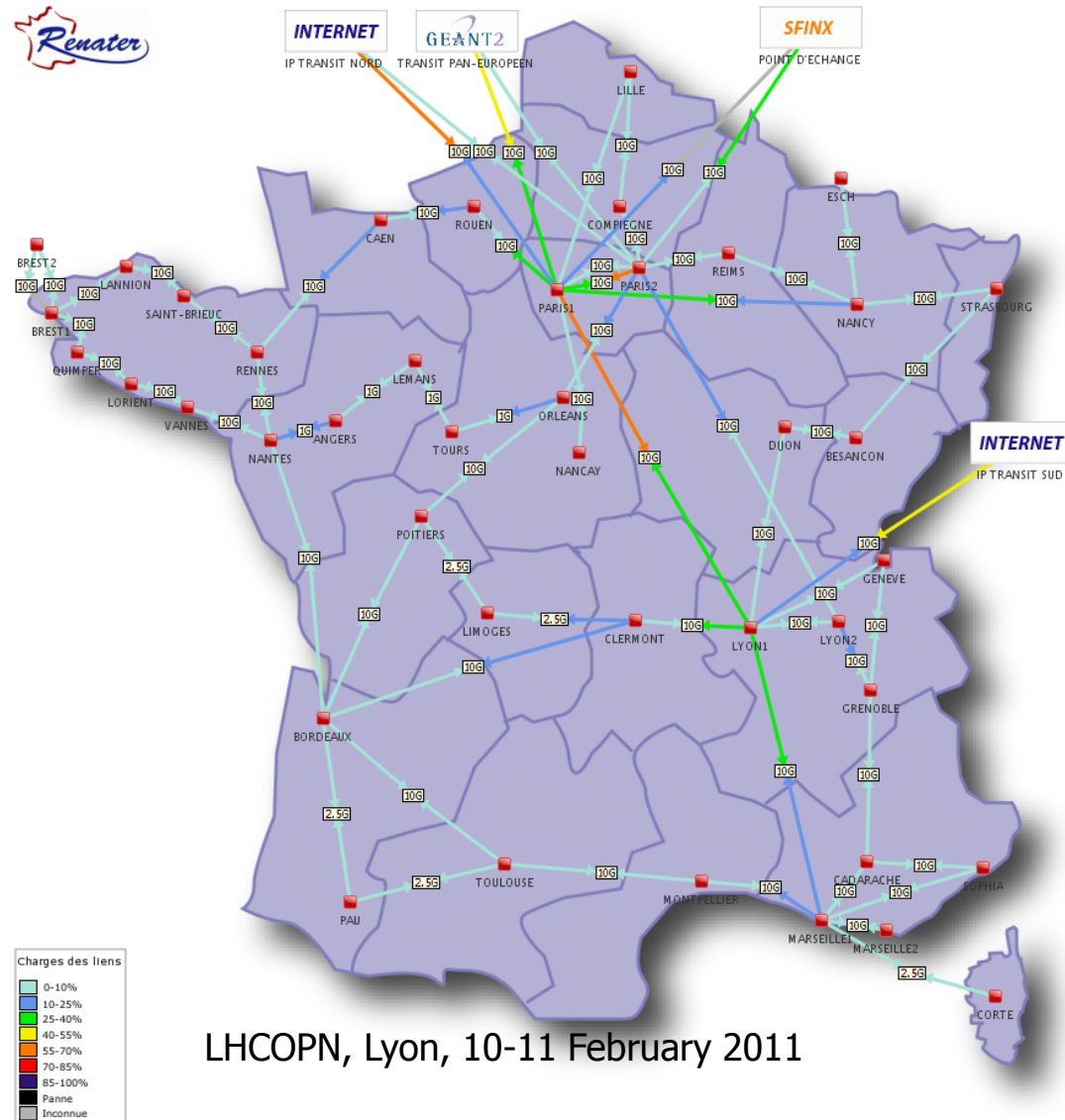




RENATER

Le réseau national

http://pasillo.renater.fr/weathermap/weathermap_france.html



LHCOPN, Lyon, 10-11 February 2011

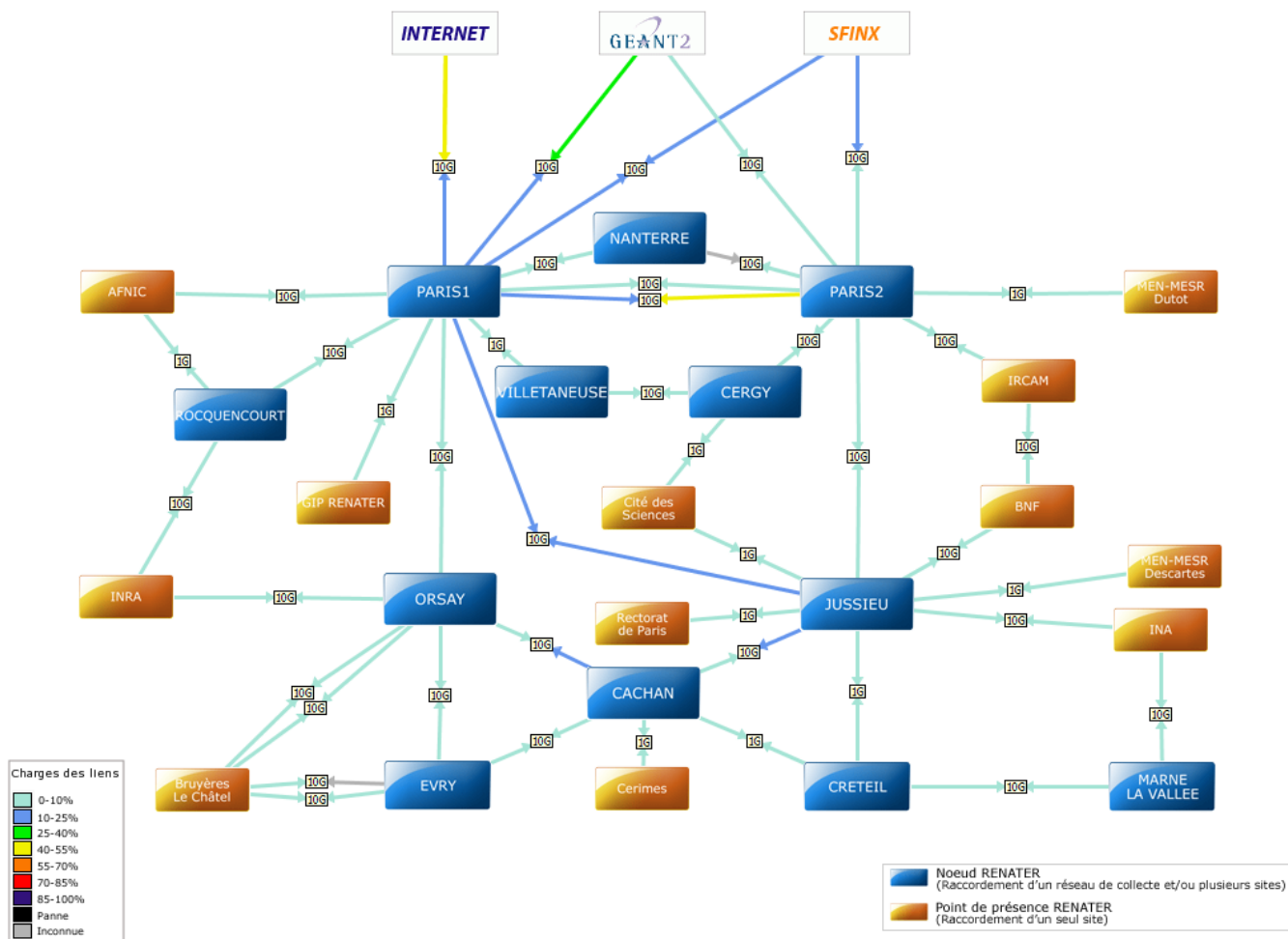
Last update: Wed Feb 09 15:45:03 CET 2011





RENATER L'Ile de France

http://pasillo.renater.fr/weathermap/weathermap_idf.html



Last update: Thu Sep 23 15:08:06 CEST 2010

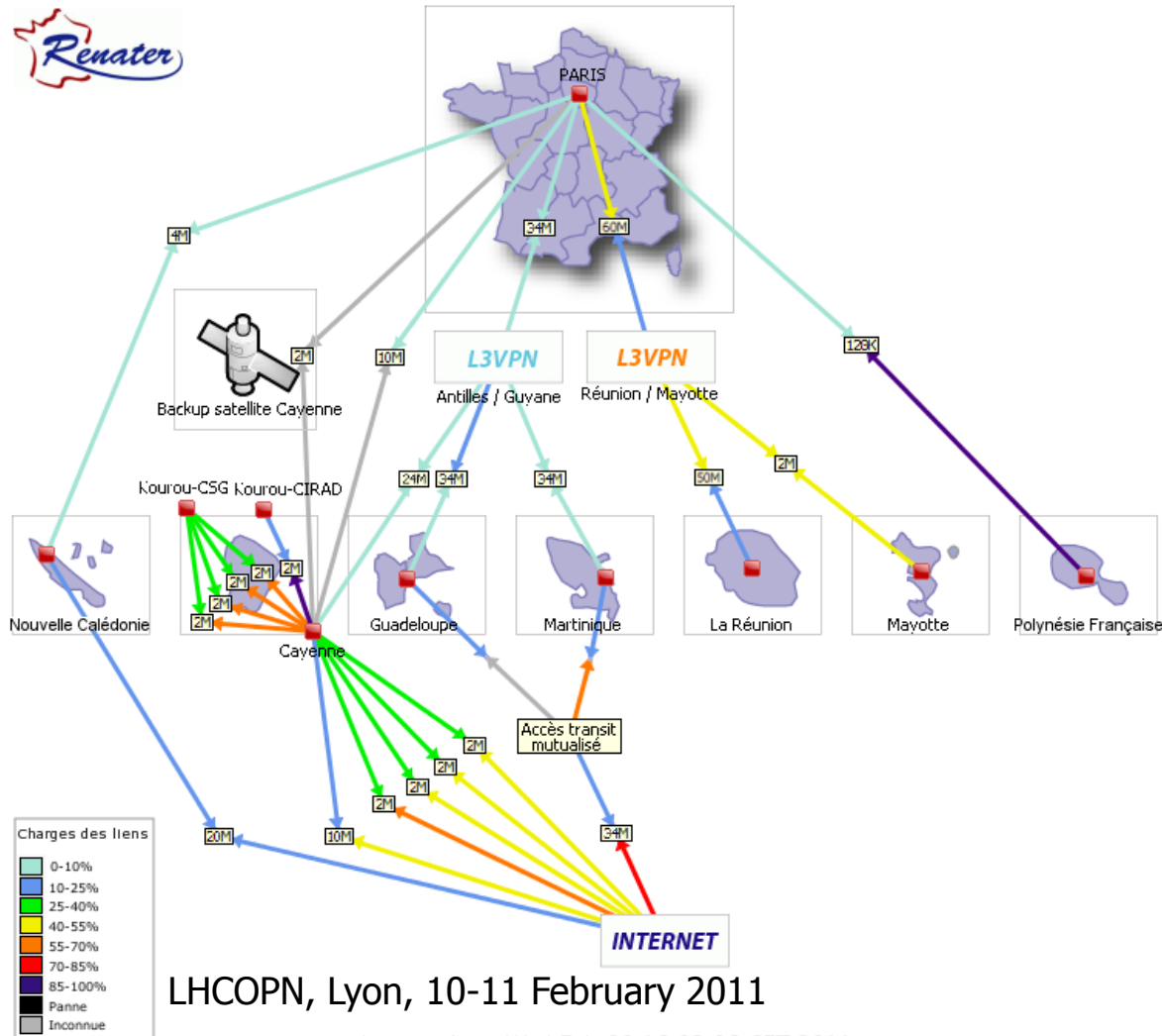
LHCOPN, Lyon, 10-11 February 2011





RENATER DOM-TOM

http://pasillo.renater.fr/weathermap/weathermap_domtom.html



LHCOPN, Lyon, 10-11 February 2011

Last update: Wed Feb 09 16:03:06 CET 2011



Service portfolio

- Packet/circuits
 - IP (complete set)
 - MPLS
 - Lightpaths
 - Wavelengths
- SLA (24/7, MTR: 4h, Availability: 99.95%)
- Security
- Authentication
- And many more...





Scientific communities

- Grid research: GRID5000 (a private optical 10G network for +10 sites, extending now to Luvemburg, with international extension to JP, Brasil, etc.)
- NGI: Between overprovisioned IP to dedicated 10G lightpaths
- Astronomy: 10G circuit to LOFAR





Scientific communities

- HPC : support to DEISA and PRACE + Montpellier/Lyon circuit for CC-IN2P3
- Fusion: Fully instrumented PoP in Cadarache (1 span from Marseille-MOLEN, 1 span from Grenoble, 1 span from Nice, 2 spans from Lyon, Montpellier or Geneva)
- Support of PRACE node in Bruyere le chatel (TGCC) with multi fiber connections.





New project

- Transport of reference signals for time-frequency coordination of atomic clocks
- Extensions planned to Braunschweig and Hannover through the FR/DE CBF, and later to other scientific labs in Europe
- Pre-design phase for a time/frequency distribution service across Europe through GEANT





RENATER and HEP





Production service

- RENATER dark fibers between Lyon (CC-IN2P3) and Geneva (CERN) and between Grenoble (UJF) and Geneva (CERN)
- Back-up circuits (LHCOPN) for FR-T1 (Lyon) to DE-T1 (Karlsruhe) through CBF.
- Otherwise, GEANT allows also T1-T1 connectivity.





Production service

- Existing 10 G lightpath between Lyon (T1) and GRIF (T2 in Paris region), lightpath provision to GRIF between Paris and Orsay, etc.
- All other T2 are currently connected to RENATER IP network with 1/10G interfaces, but the upgrade to 10 G will be possible when justified.
- LAPP in Annecy will be soon on the fiber infrastructure as well





100G testbeds





Preliminary discussions

- Goal:
 - T1-T0 between Lyon and Geneva
 - T1-T1 between Lyon and Karlsruhe (through CBF)
 - PRACE T0-T0 between Julich and Bruyere
- Multi-vendors, Multi-technologies and multi fiber providers





Final achievement

- Hardware partner: CIENA
- Fiber provider: RENATER
- 2 testbeds: Lyon-Geneva and Lyon-Dijon





1st phase:

100G tests at Ciena Labs

-

2nd – 3rd September 2010





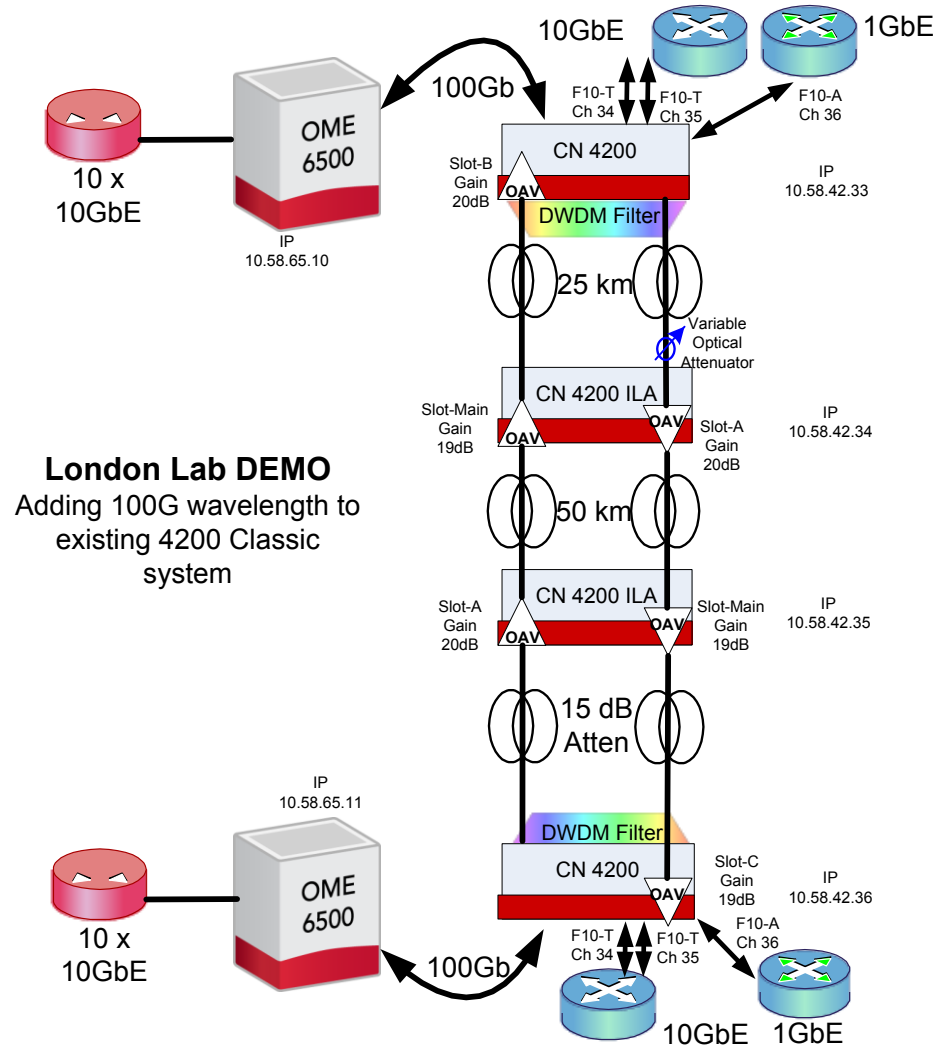
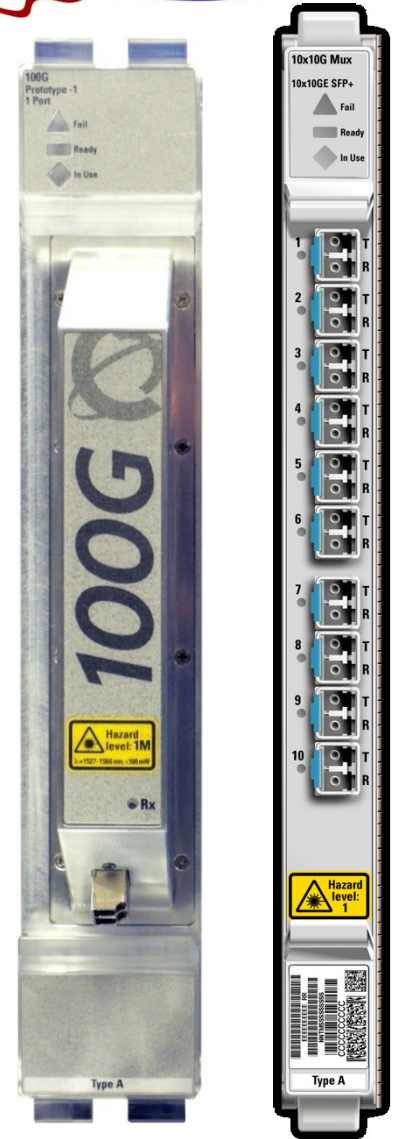
Goal and description

- To validate in lab the feasibility of 100G field tests on production links without any traffic interruption
- RENATER's Lyon-Geneva link was rebuilt in lab as exactly as possible with CN4200
- A Nortel 100G DWDM wavelength was added to the system





Test bed



LHCOPN, Lyon, 10-11 February 2011





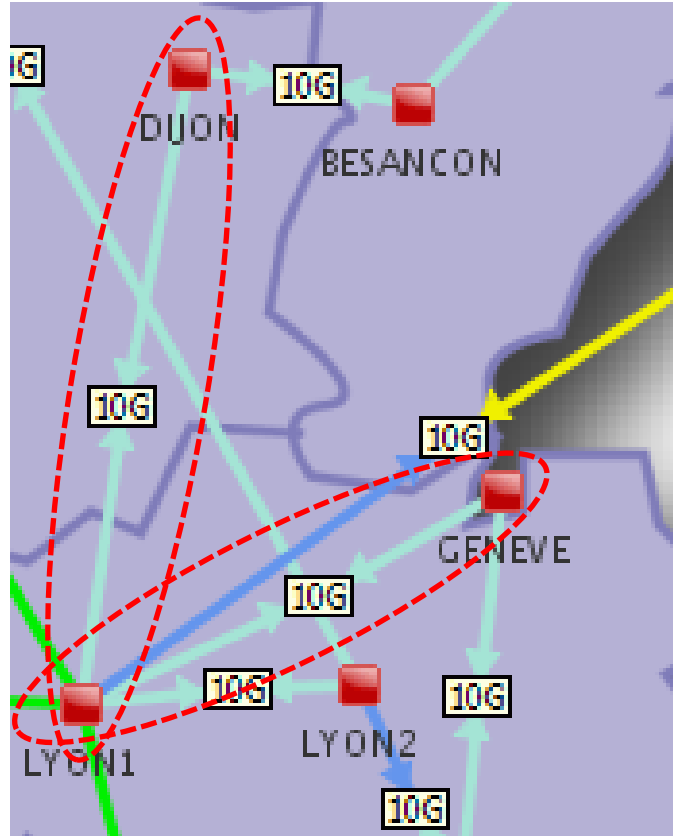
2nd phase

100G Tests





Tests 100G



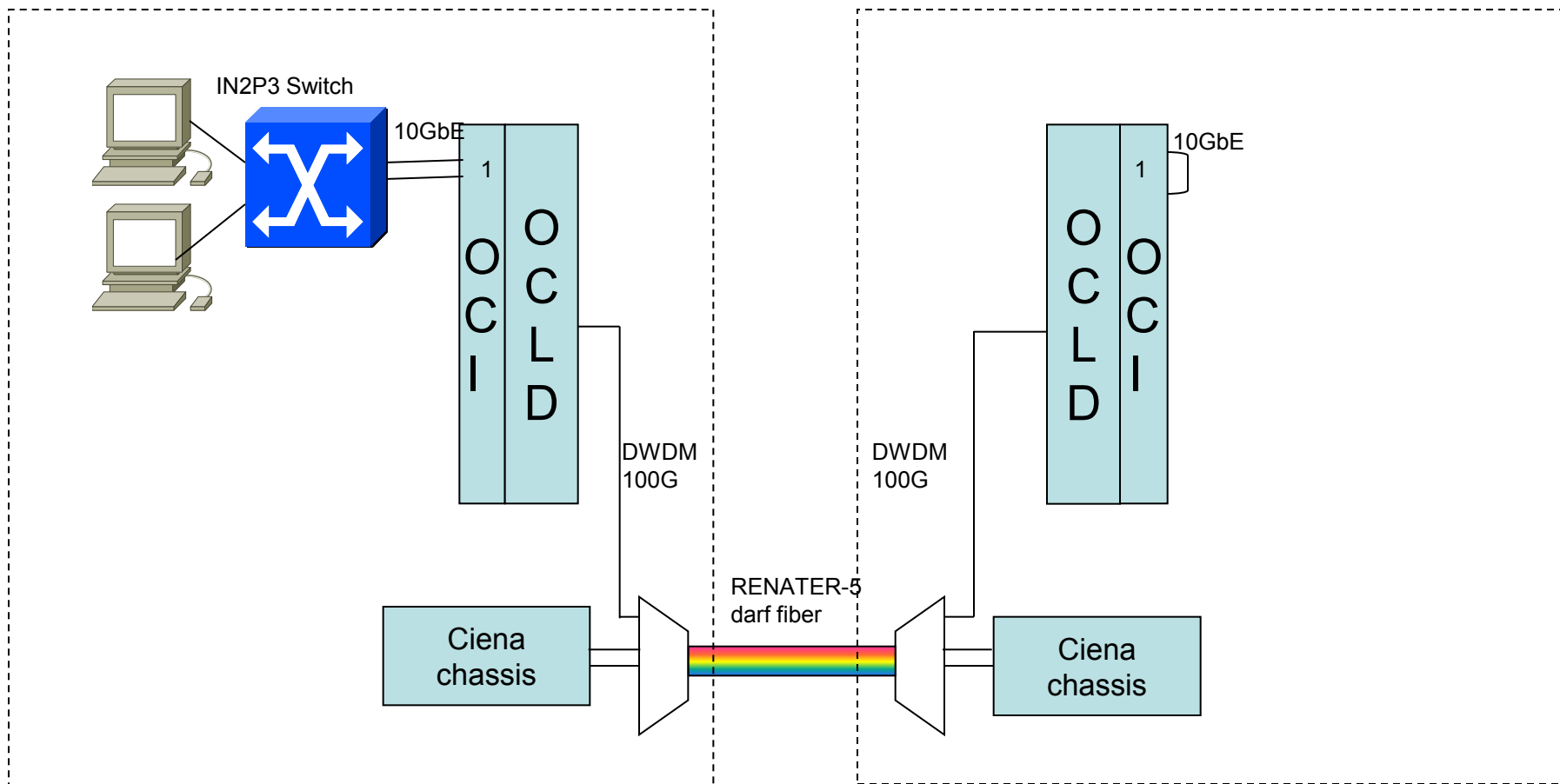
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Lyon-Geneva: step 1

- Addition of an IPERF server at Lyon PoP



LYON

GENEVA

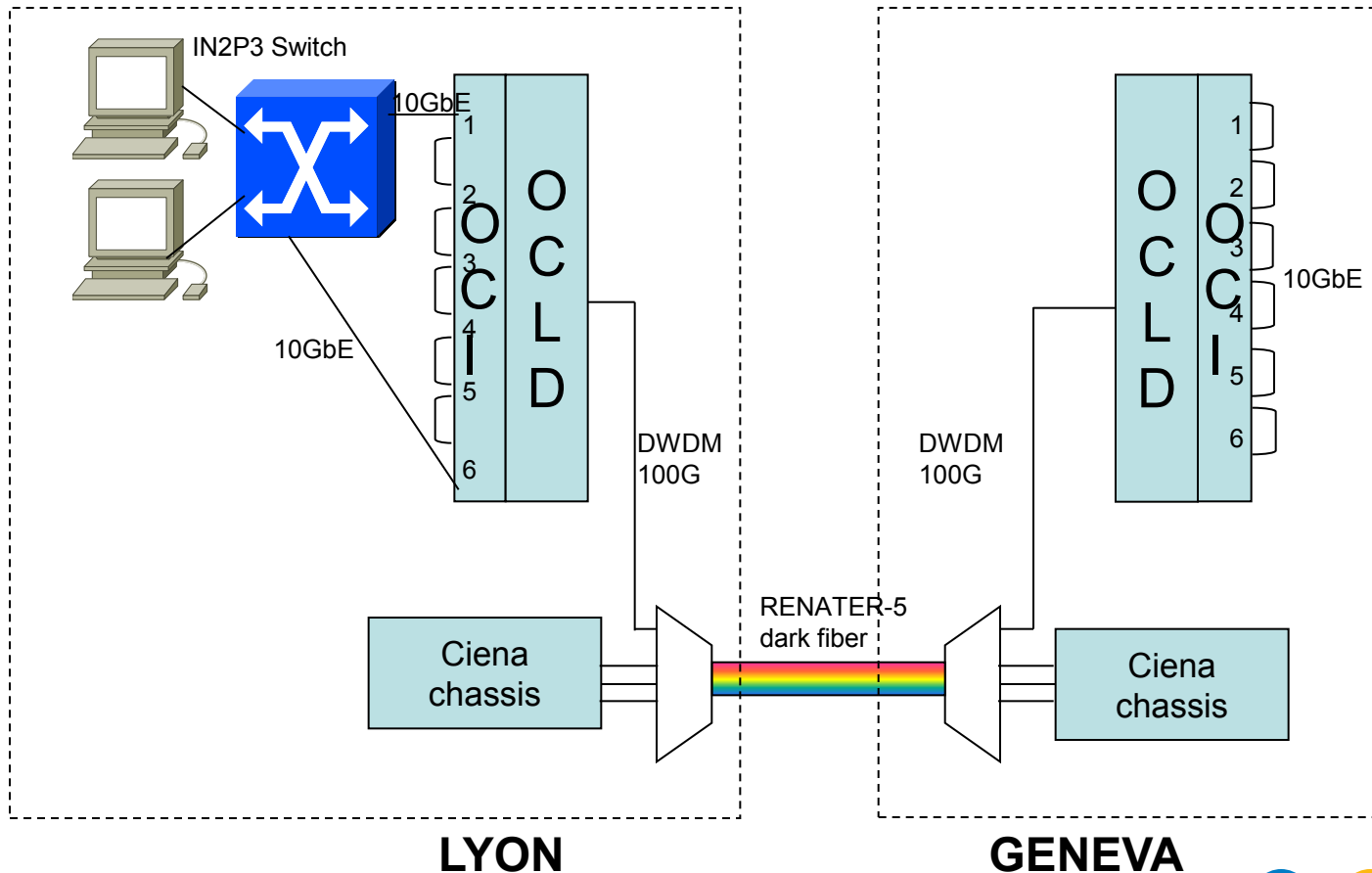
LHCOPN, Lyon, 10-11 February 2011





Lyon-Geneva: step 2

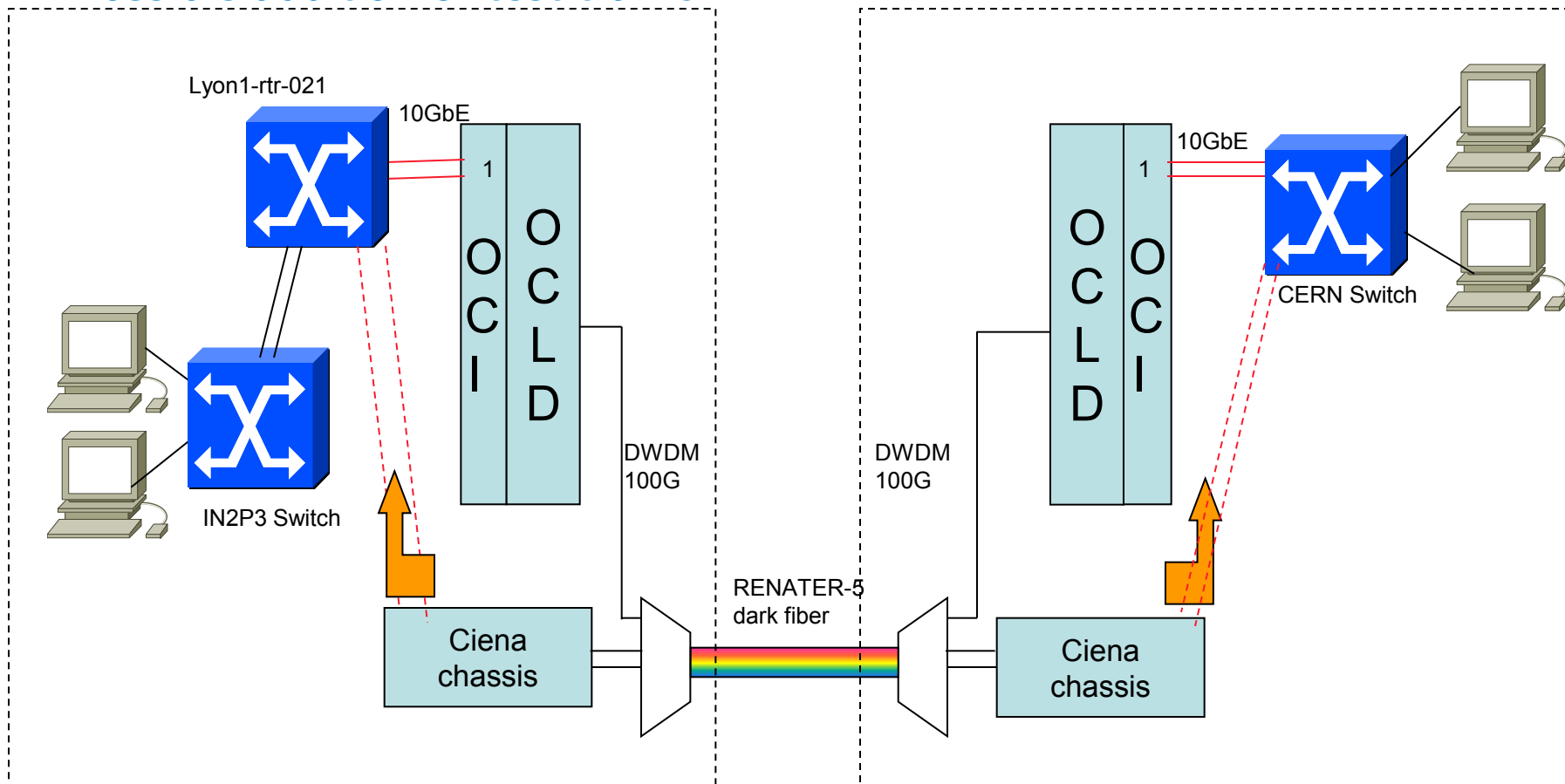
- Several round trips done on the link





Lyon-Geneva: step 3

- LHC production link moved to 100G transponder
- Possible addition of test traffic



LYON

GENEVA

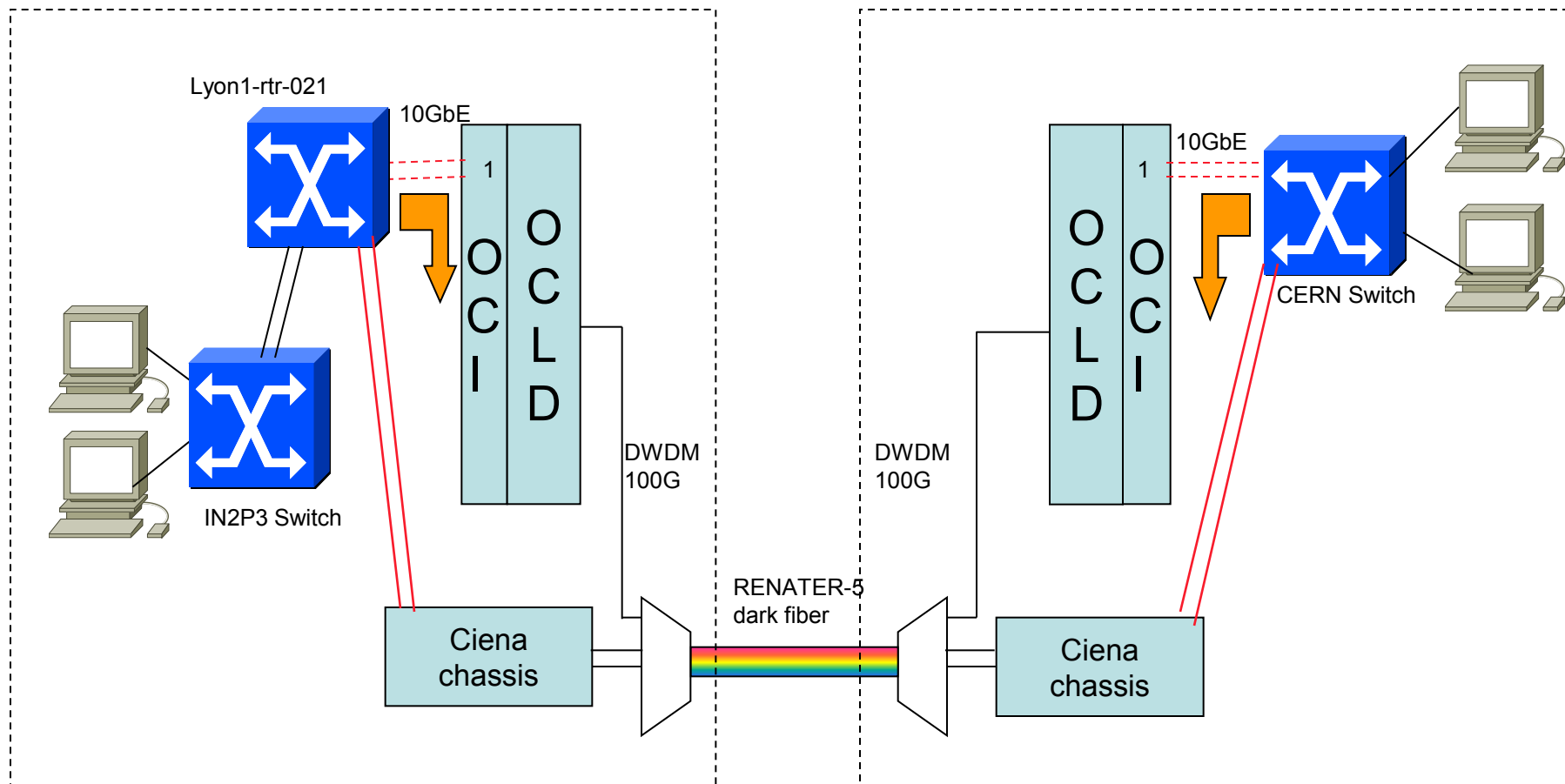
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Lyon-Geneva: step 4

- LHC production link moved to 10G transponder



LYON

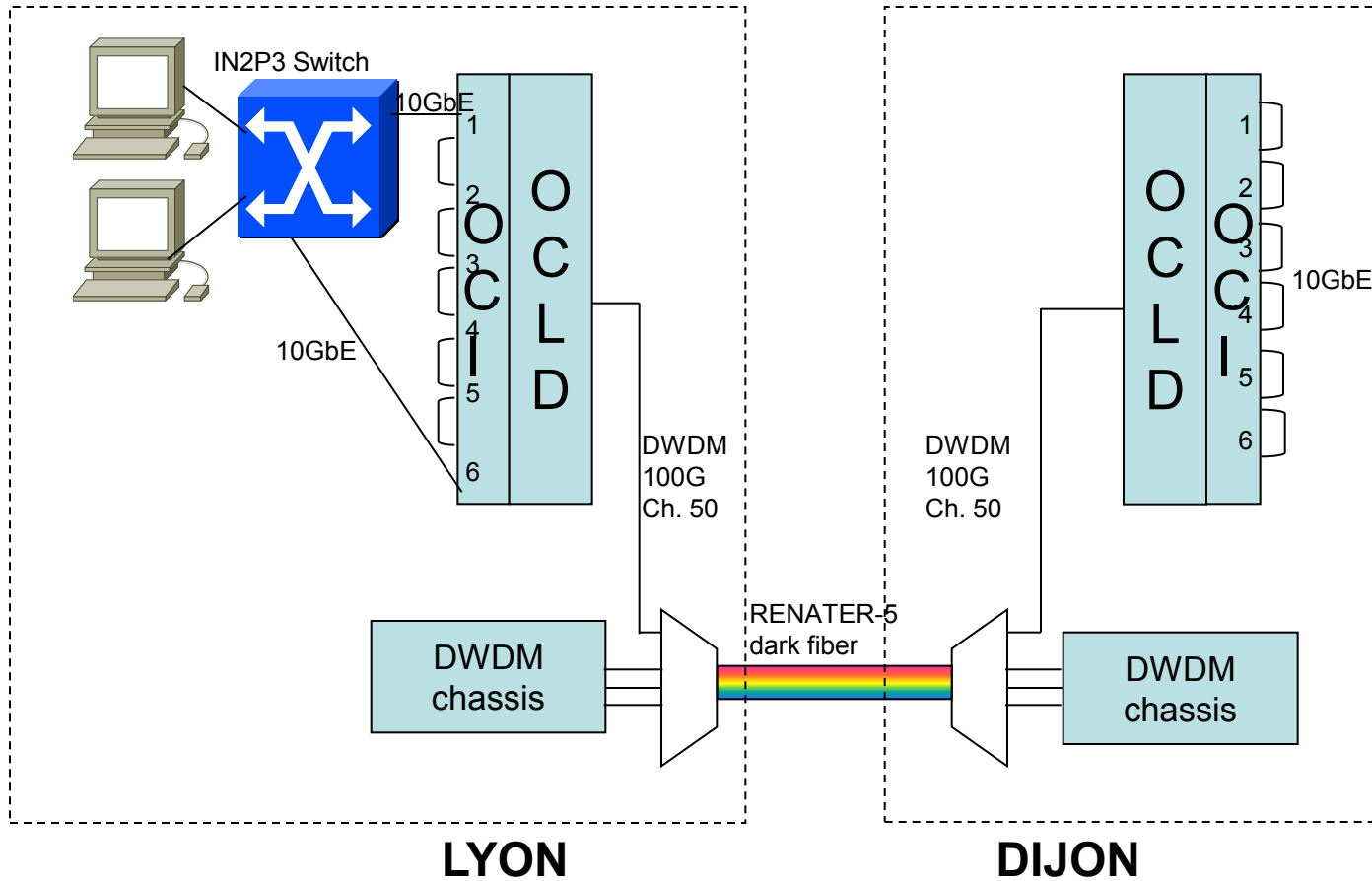
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GENEVA





Lyon - Dijon



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- 100G !

CCIN2P3/telecom/stats/graphiques/cccata100g - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://netstat.in2p3.fr/weathermap/graphiques/cata-100g.html

METROPOLE RENATER Weathermap CCIN2P3/telecom/stats/graphiqu...

DE CALCUL CENTRE DE CALCUL CENTRE

Utilisation de bande passante pour cccata100g

(dernière mise à jour: 17/12/2010 13:15)

Summary

100 GBits/s ethernetCsmacd

Values at last update:
Average bits in: 0.00 bits/sec Average bits out: 0.00 bits/sec

Par jour

bits per second

50 G

0

00:00 06:00 12:00 18:00 00:00 06:00

■ Average bits in ■ Average bits out

Terminé





OME6500 Flight Case 1

- The Flight case provides:
 - 14 slot converged OM6500 shelf
 - Shelf Processor in one slot
 - Power cards, MIC and Access Panel
 - High Speed Fans
 - 100G OCLD
 - 10 by 10 OCI
 - AC Rectifier:
 - Supplied with 3 Pin UK Plug and 2PIN European Adaptor
 - Dimensions with front and rear covers
 - H 1300mm, W 650mm, D 860mm
 - Dimensions without covers
 - H 1300mm, W 650mm, D 670mm
 - Weight
 - TBD



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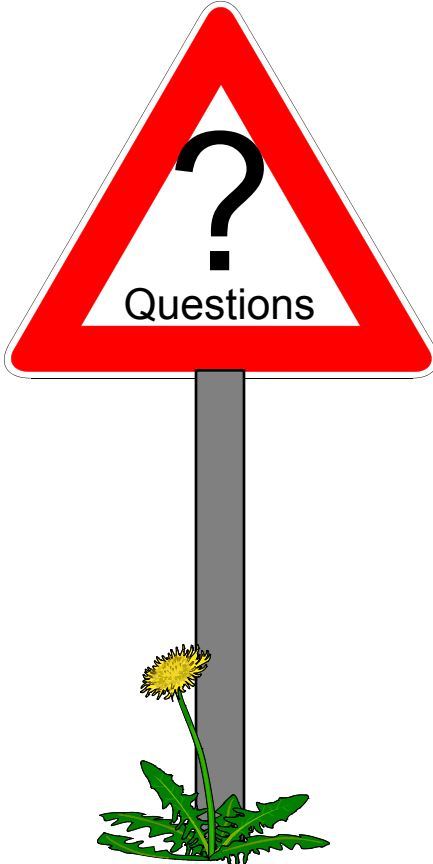




Next steps

- Run another testbed between the Ecry-Genopole to the Bruyere-PRACE node with full fluxes from genome sequencing machines
- Establish the multi-vendor testbed between Bruyere and Julich
- Implement 100 G production services when justified and affordable!





LHCOPN





Cisco CRS-3

- 1 baie 800x800 42U pour accueillir le CRS-3
- Alimentation : triphasée - 380V – 3 kVA et compter 2 alims si prod (si tests, une alim suffirait)
- Le lien 100G entre le CRS-3 et le Ciena se ferait sur des CFP LR4 (4x25Gbps) qui fonctionnent en 1310 nm sur du monomode (G652) sur une distance comprise entre 2m et 10km
- Interface(s) locale(s) du CRS-3 client reste à définir (si LR4 : voir ci-dessus)

