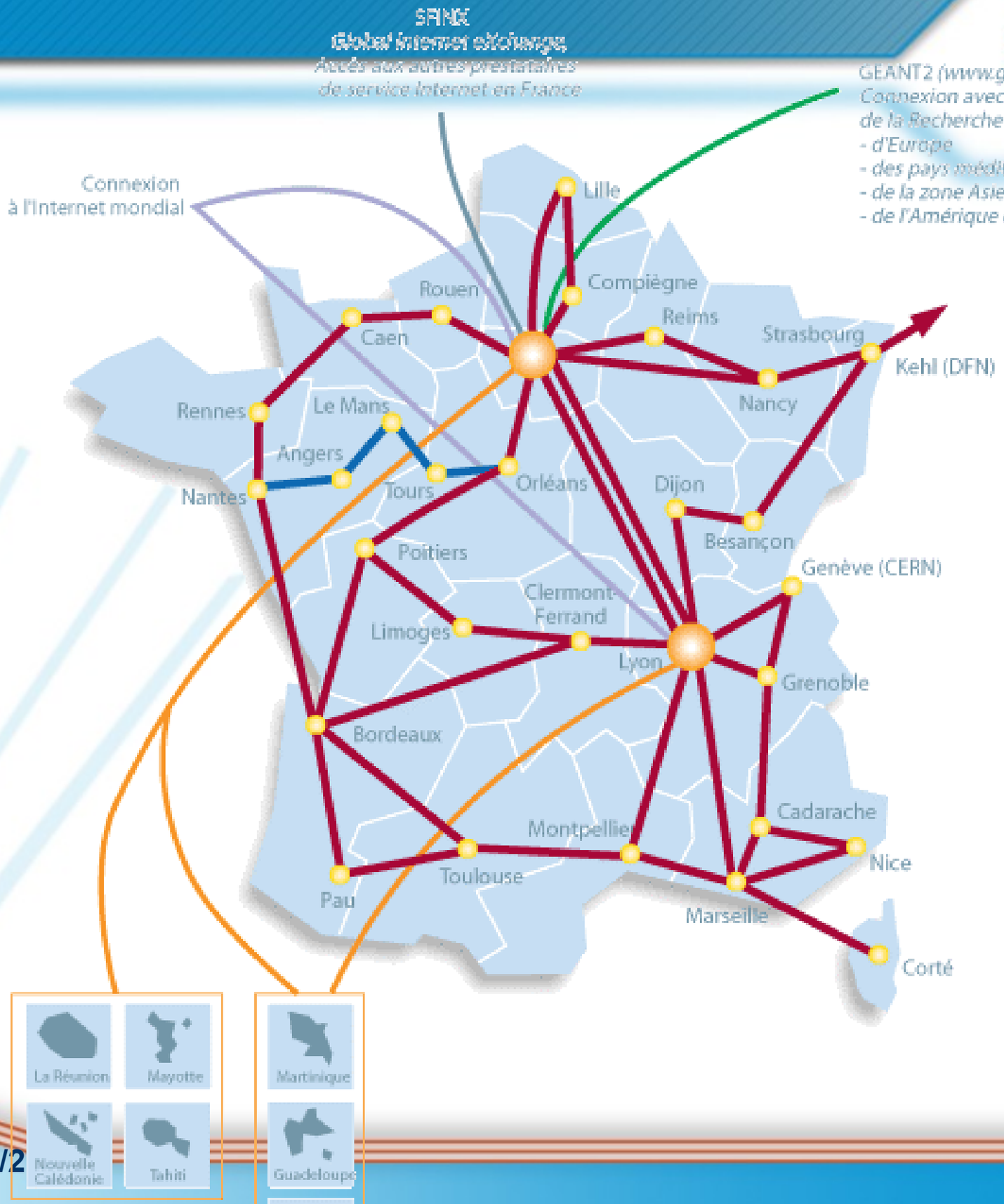
Centre de Calcul de l'IN2P3/CNRS

LCG France Network

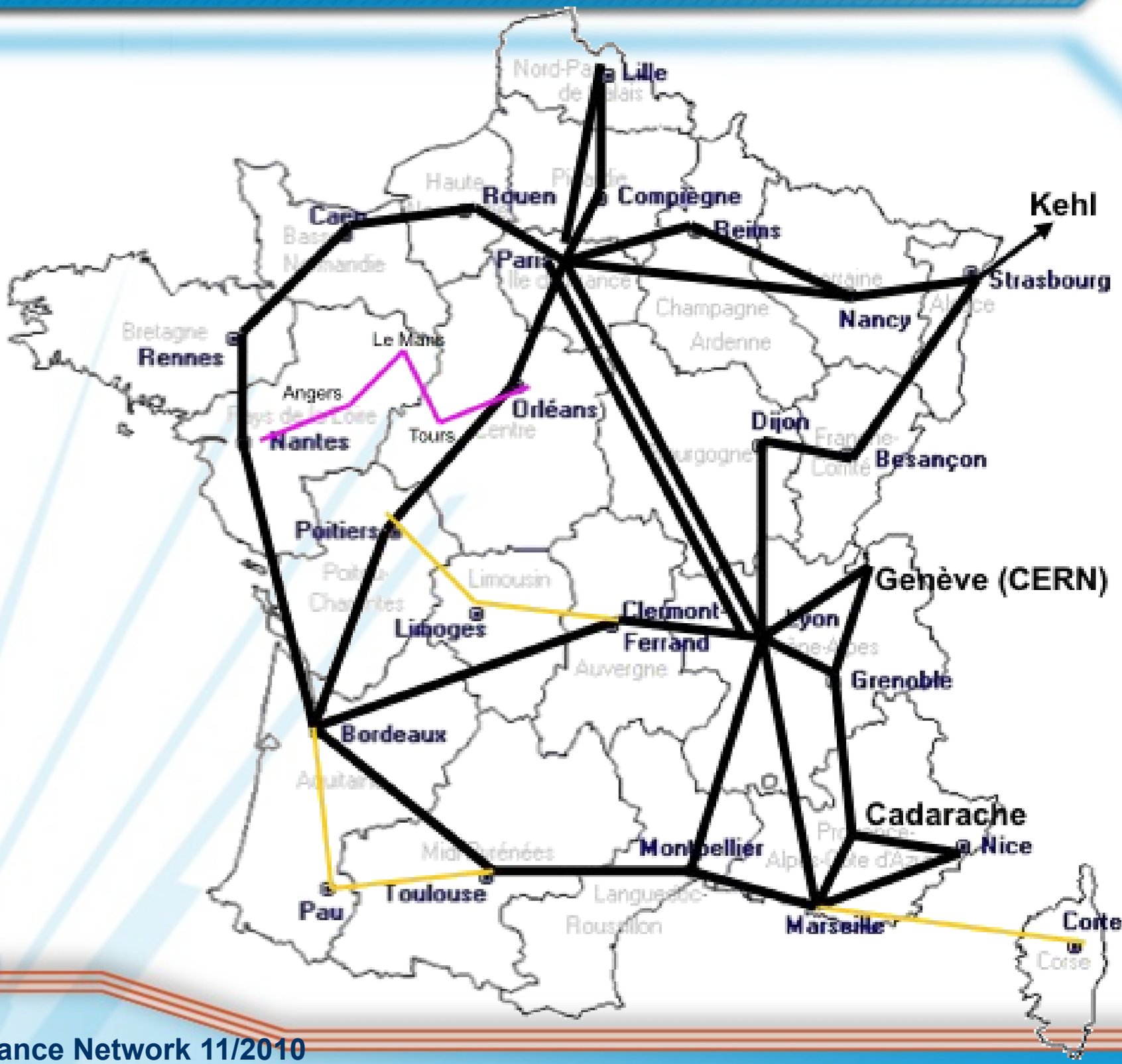
jerome.bernier@in2p3.fr

Network 11/2010

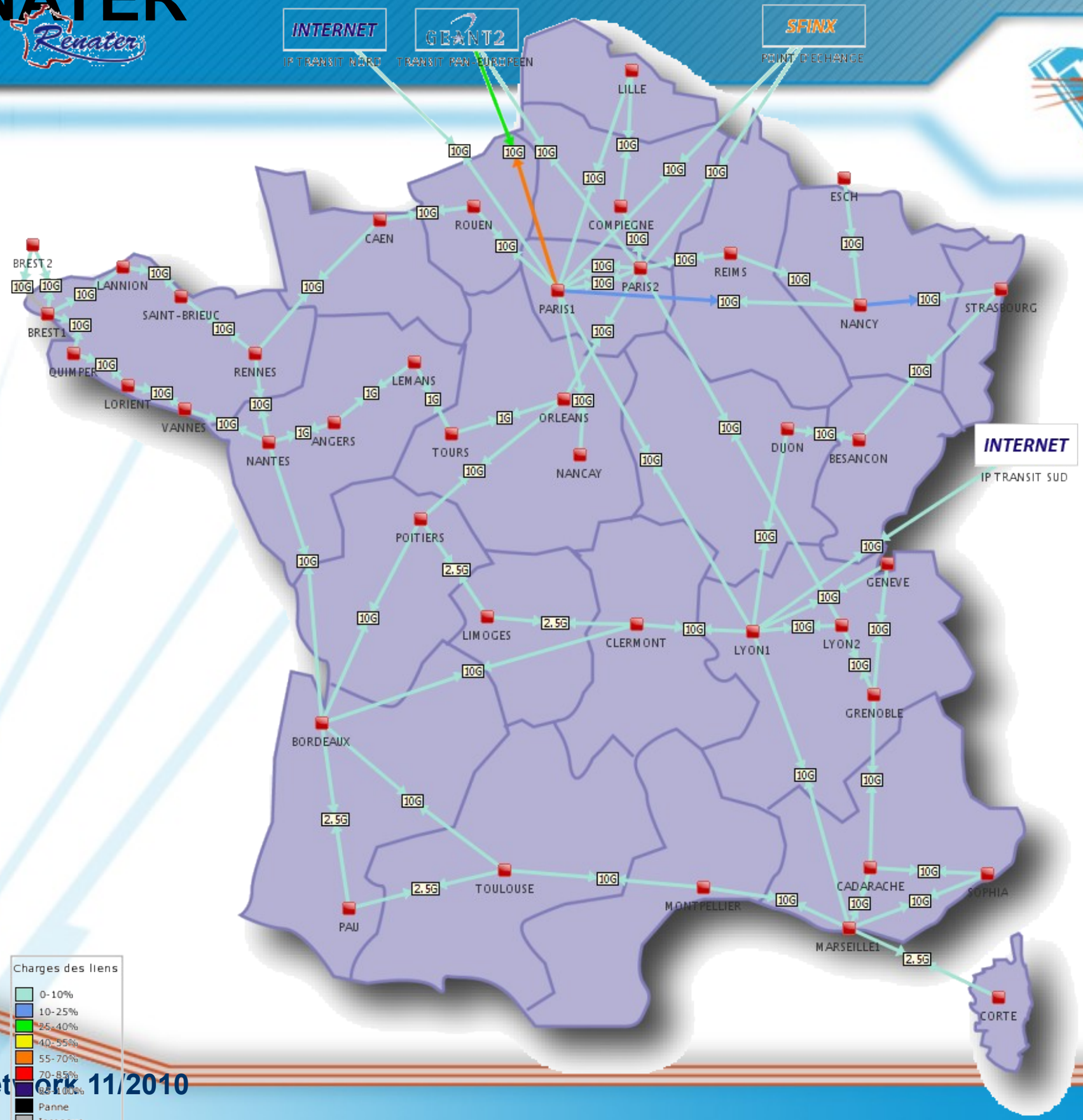
RENATER


SFINX
Global Internet eXchange
Accès aux autres prestataires
de service Internet en France
GEANT2 (www.geant2.net)
Connexion avec les réseaux
de la Recherche :
- d'Europe
- des pays méditerranéens
- de la zone Asie Pacifique
- de l'Amérique du sud et centrale
CCIN2P3
Connexion
à l'Internet mondial
Lille
Compiègne
Rouen
Reims
Caen
Strasbourg
Kehl (DFN)
Rennes
Le Mans
Nancy
Angers
Nantes
Tours
Orléans
Dijon
Besançon
Poitiers
Genève (CERN)
Clermont
Ferrand
Limoges
Lyon
Grenoble
Bordeaux
Cadarache
Montpellier
Nice
Toulouse
Pau
Marseille
Corté
La Réunion
Mayotte
Martinique
Nouvelle
Calédonie
Tahiti
Guadeloupe

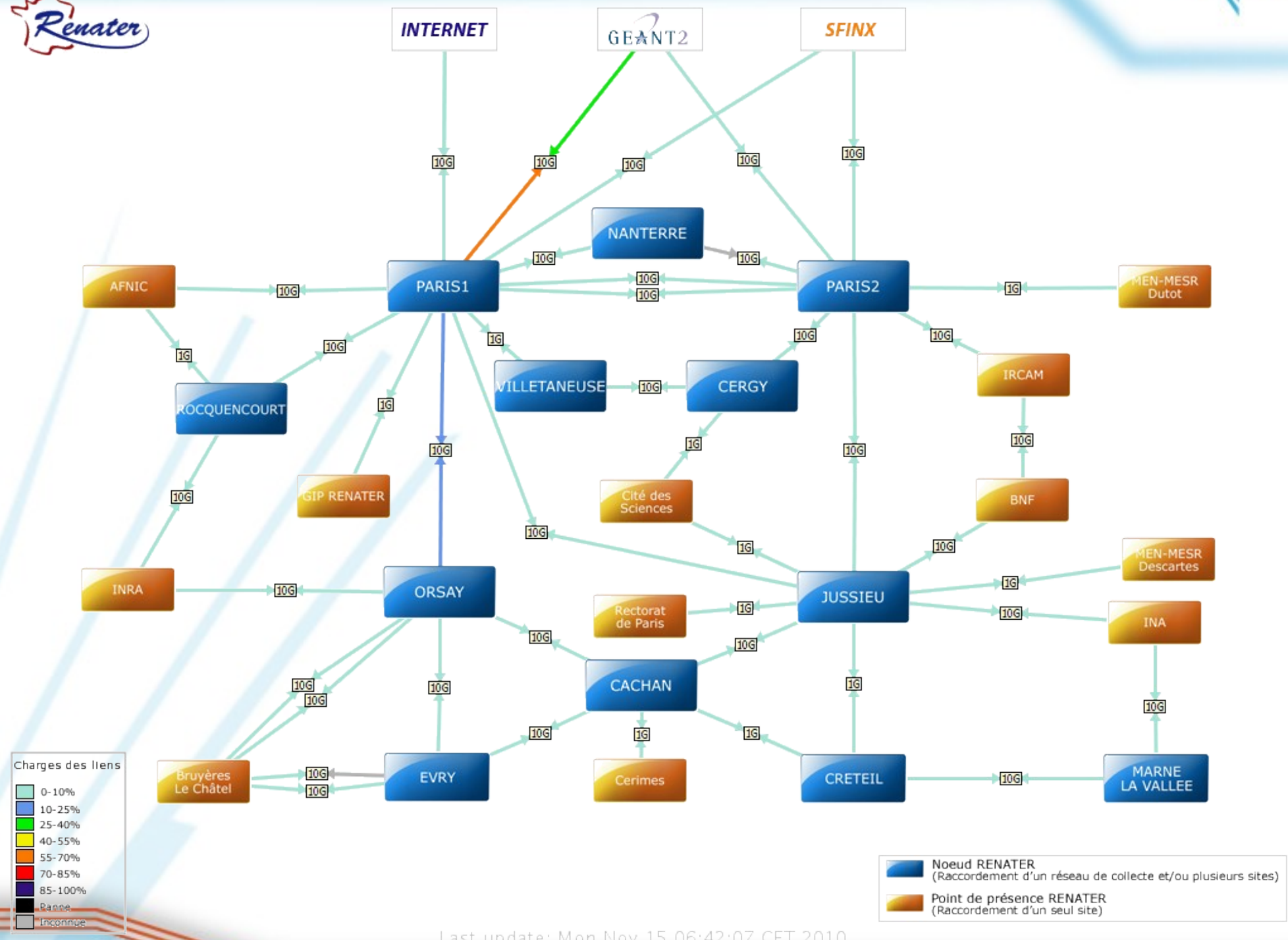
RENATER Dark Fibers



RENATER

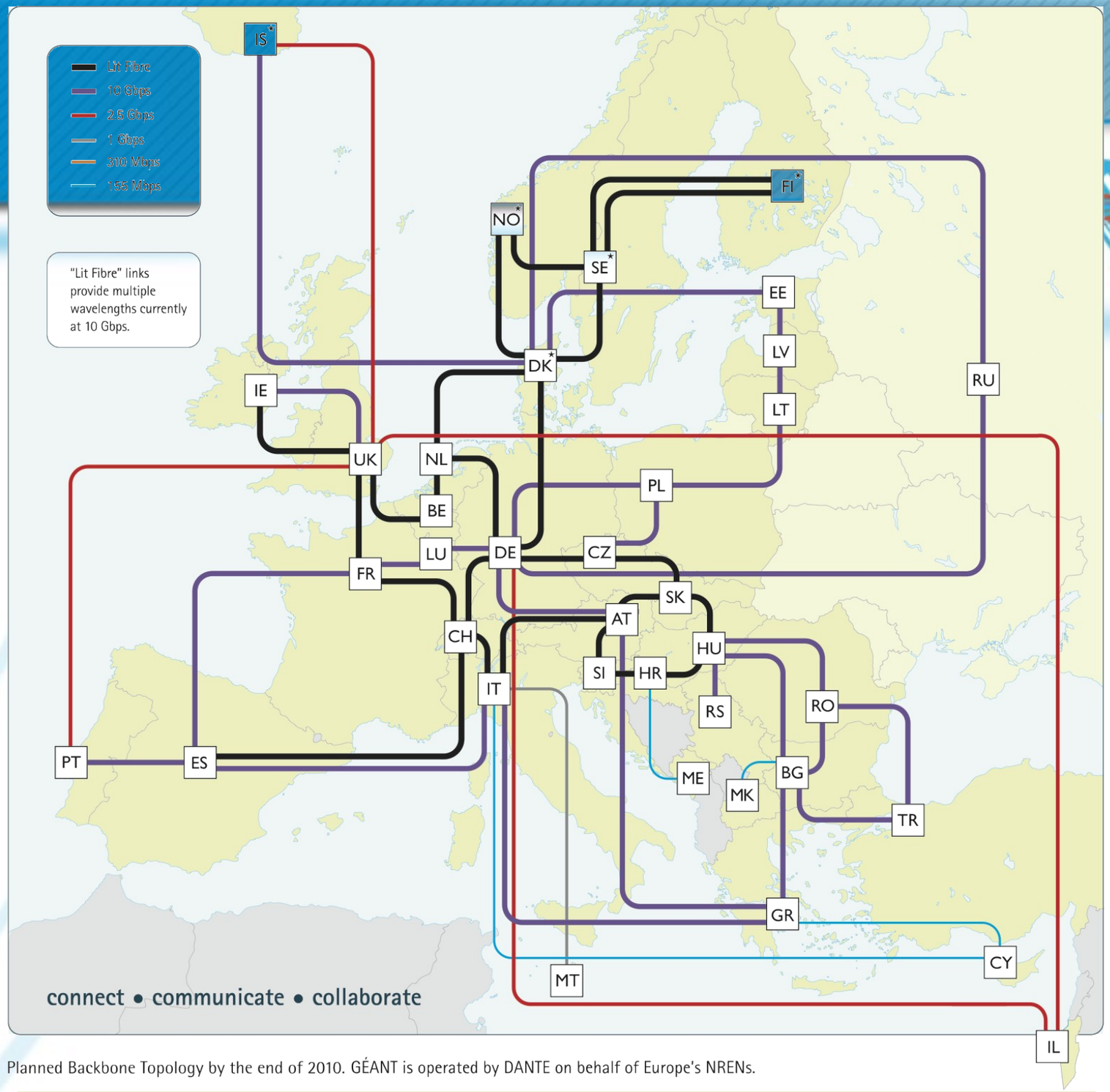

INTERNET
IP TRANSIT NORD
GEANT2
TRANSIT PAN-EUROPEEN
SFINX
POINT D'ECHANGE
LILLE
ESCH
ROUEN
CAEN
COMPIEGNE
REIMS
PARIS2
PARIS1
NANCY
STRASBOURG
BREST2
LANNION
SAINT-BRIEUC
BREST1
QUIMPER
RENNES
LEMANS
LORIENT
VANNES
ANGERS
ORLEANS
TOURS
NANTES
NANCAY
DIJON
BESANCON
INTERNET
IP TRANSIT SUD
POITIERS
GENEVE
LIMOGES
CLERMONT
LYON1
LYON2
GRENOBLE
BORDEAUX
TOULOUSE
CADARACHE
SOPHIA
MONTPELLIER
PAU
MARSEILLE1
CORTE
10G
2.5G
1G
Charges des liens
0-10%
10-25%
25-40%
40-55%
55-70%
70-85%
85-100%
Panne
Inconnue

RENATER Région Parisienne



GEANT

CCIN2P3



Planned Backbone Topology by the end of 2010. GÉANT is operated by DANTE on behalf of Europe's NRENs.

AT	Austria	CY	Cyprus	EE	Estonia	GR	Greece	IL	Israel	LU	Luxembourg	MT	Malta	PT	Portugal	RU	Russia	SK	Slovakia
BE	Belgium	CZ	Czech Republic	ES	Spain	HR	Croatia	IS	Iceland*	LV	Latvia	NL	Netherlands	RO	Romania	SE	Sweden*	TR	Turkey
BG	Bulgaria	DE	Germany	FI	Finland*	HU	Hungary	IT	Italy	ME	Montenegro	NO	Norway*	RS	Serbia	SI	Slovenia	UK	United Kingdom
CH	Switzerland	DK	Denmark*	FR	France	IE	Ireland	LT	Lithuania	MK	F.Y.R. Macedonia	PL	Poland						

*Connections between these countries are part of NORDUnet (the Nordic regional network)

DANTE
www.dante.net

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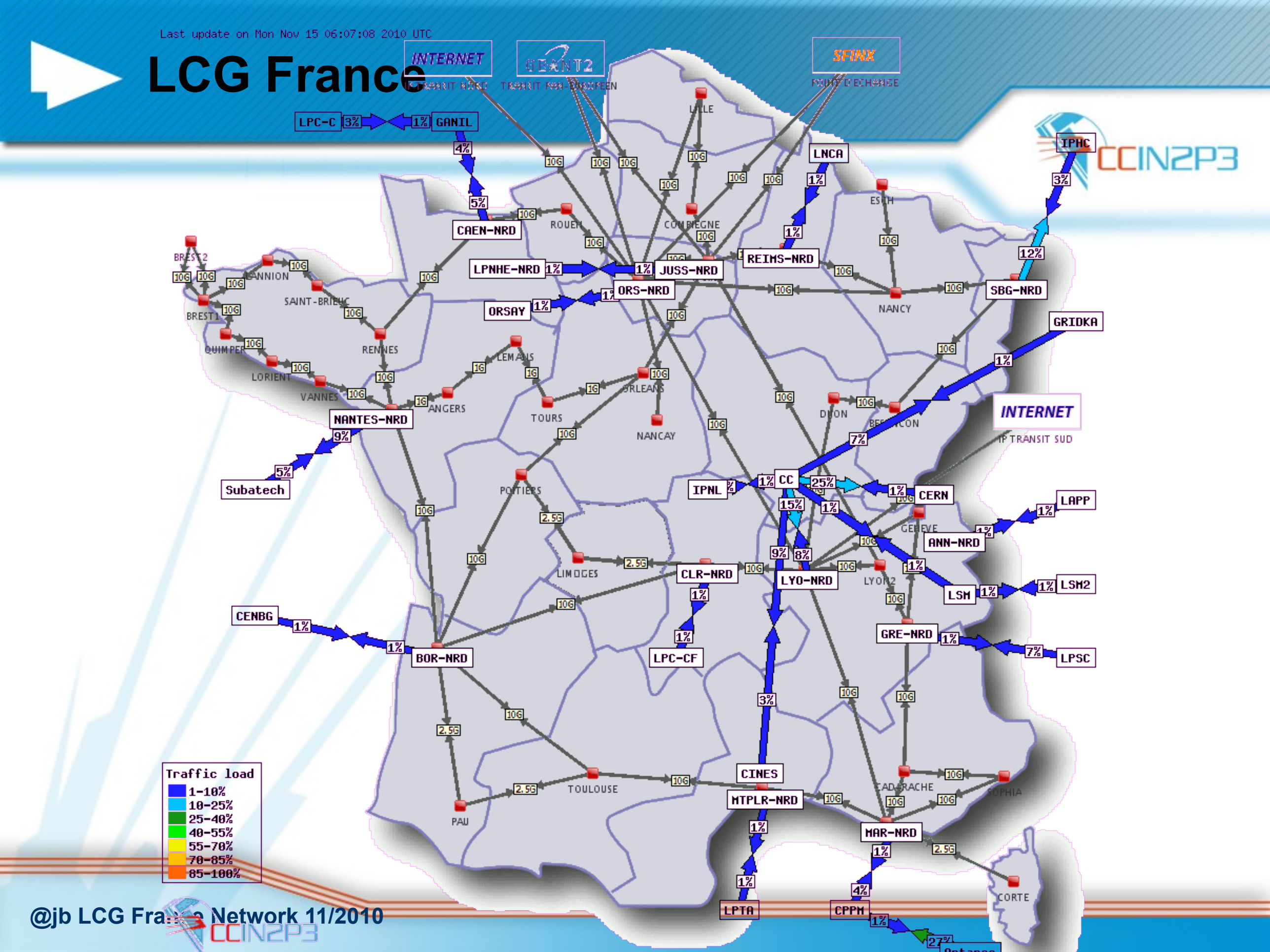
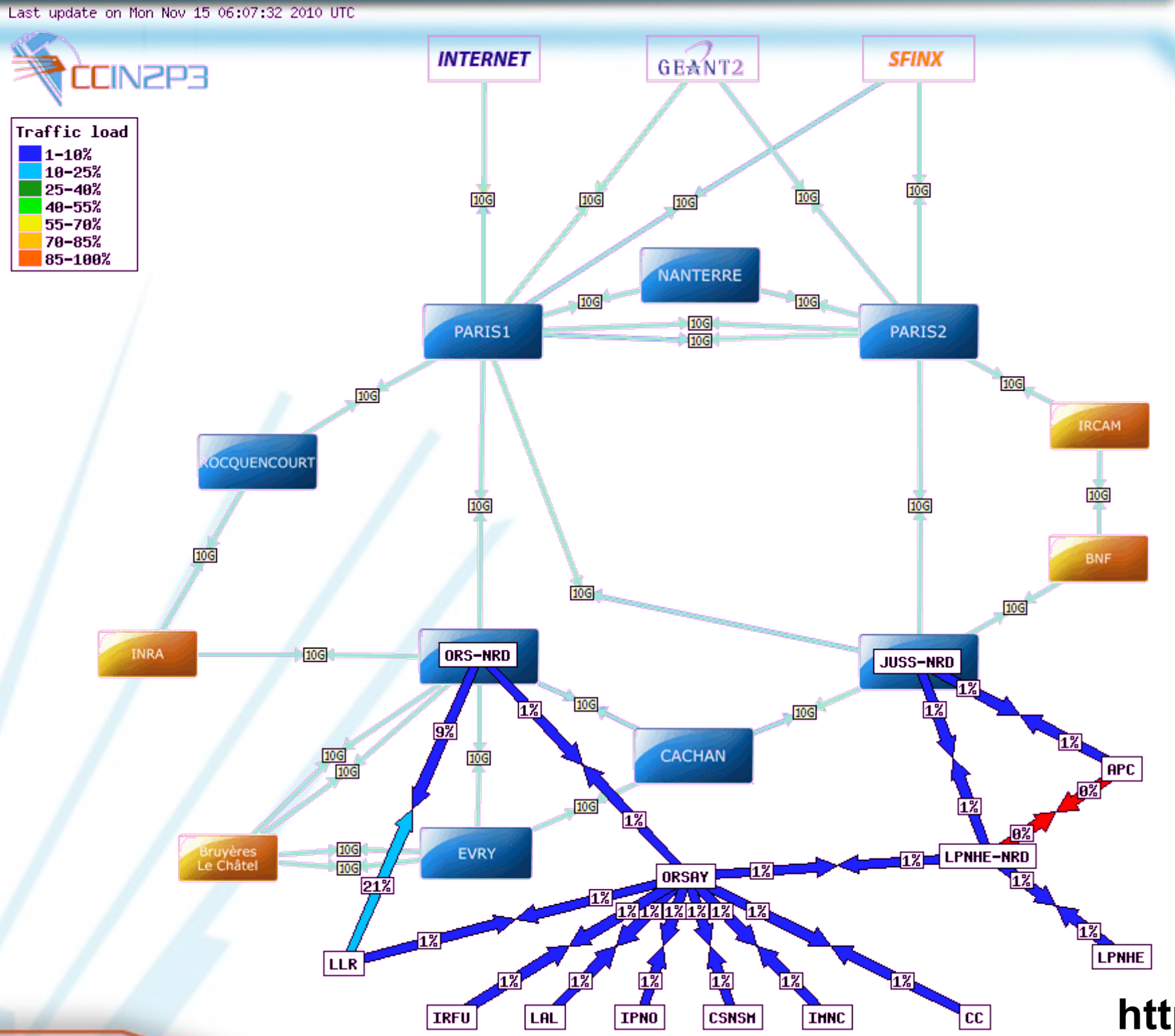
European Commission
Information Society and Media

Last update on Mon Nov 15 06:07:08 2010 UTC

LCG France



LCG France



http://netstat.in2p3.fr

LCG France

Tier-2: GRIF
- CEA/IRFU
- LAL
- LLR
- LPNHE
- IPNO

Tier-2: Subatech

Tier-2: LPC

Tier-1: CC-IN2P3

Tier-2: IPHC

Tier-3: IPNL

Tier-2: LAPP

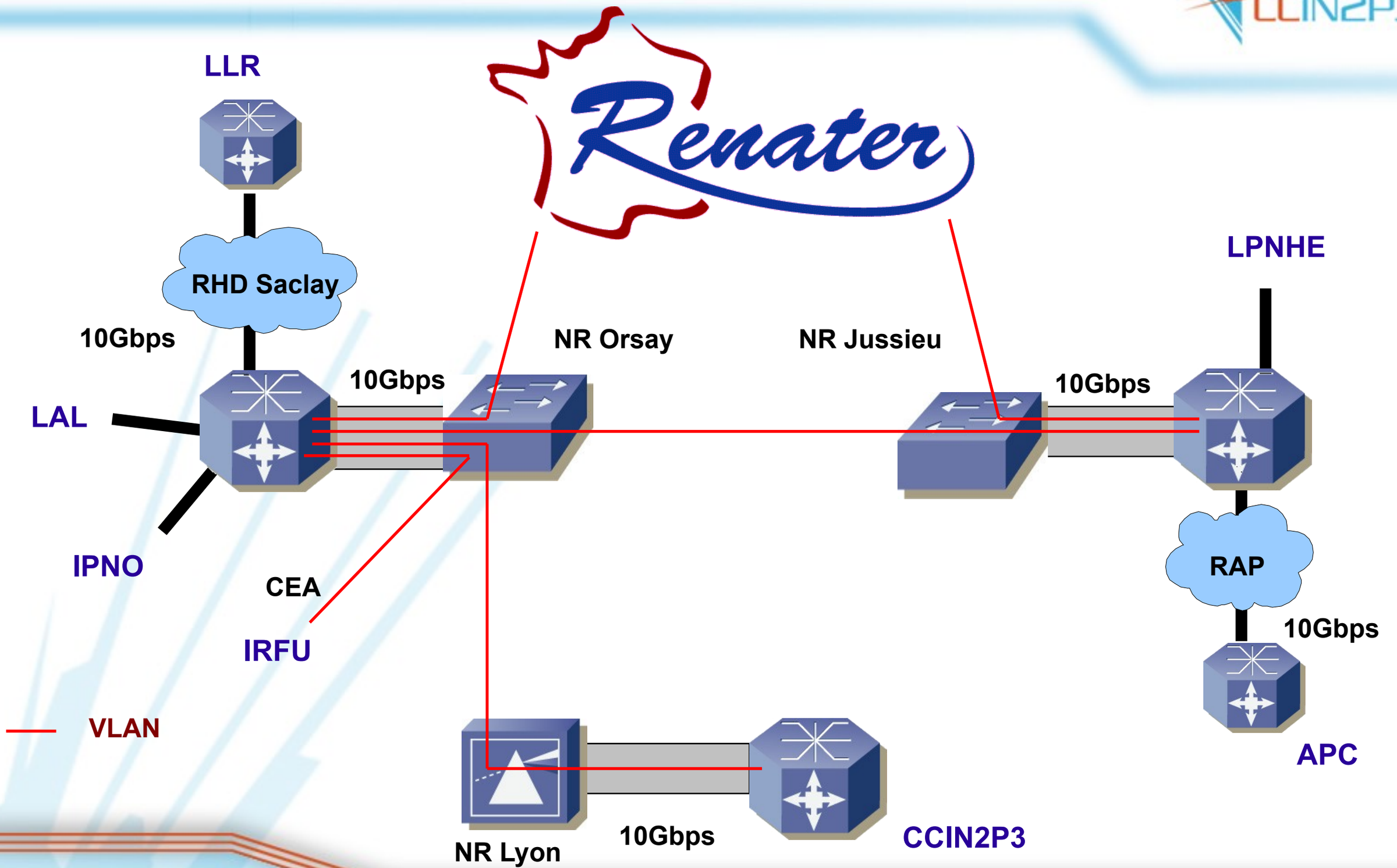
Tier-3: LPSC

AF: CC-IN2P3

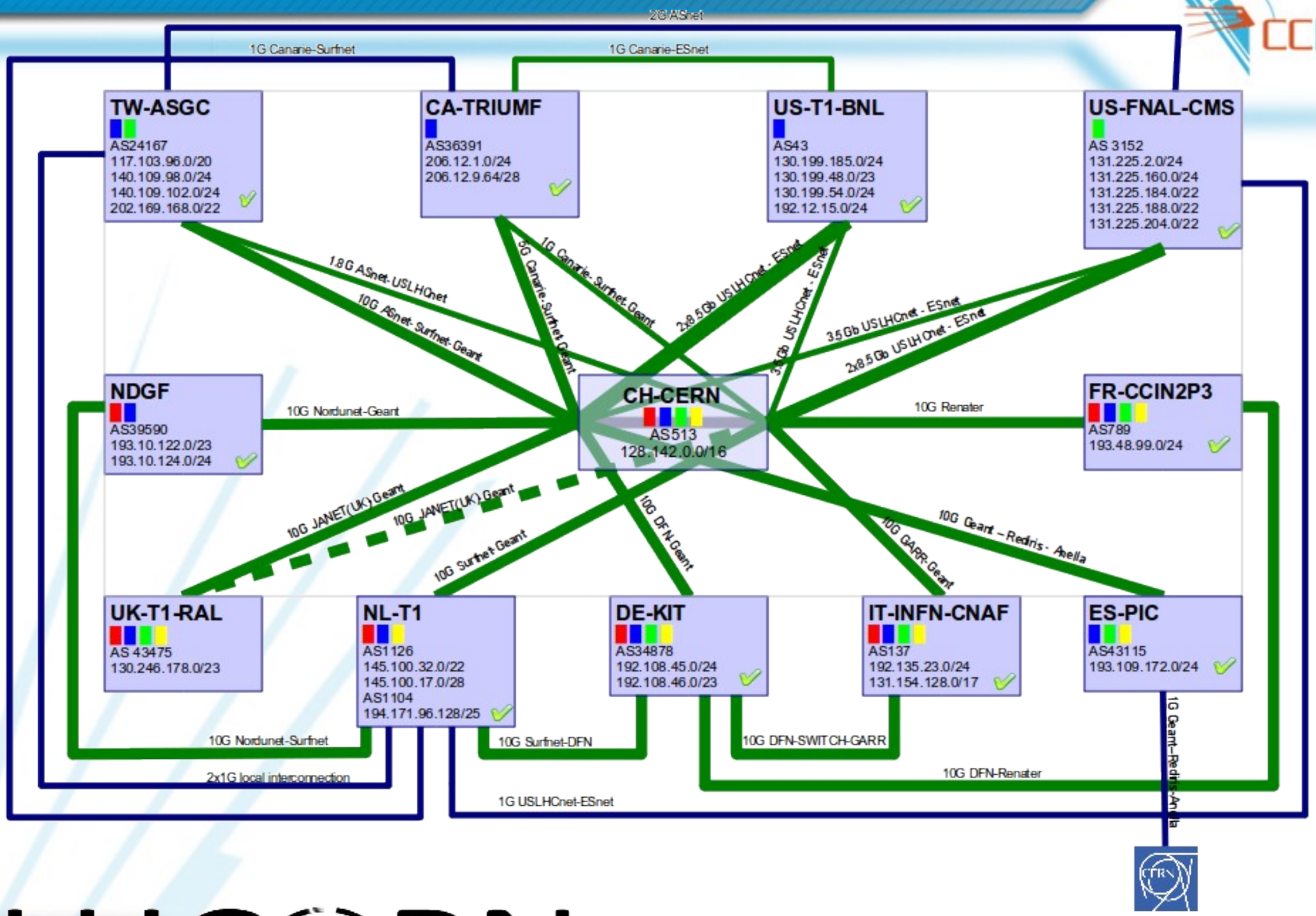
Tier-2: CPPM

Nantes
Ile de France
Strasbourg
Clermont-Ferrand
Lyon
Annecy
Grenoble
Marseille

Tier2 GRIF
Grille de Recherche Ile de France



LHCOPN



LHCOPN

CCIN2P3 infrastructure physique

Tier2 Français

Renater

Lyon

10Gb/s

CC-IN2P3

10Gb/s

CERN

Paris

GEANT2

autres Tier1/2

Tier2 GRIF

Strasbourg

DFN Deutsches Forschungsnetz

Secours à travers
Tier1 KIT Karlsruhe

KIT Karlsruhe Institute of Technology

LHC T2s connectivity working group

Collecting technical proposals addressing:

- Layer1-2 connectivity
- Layer3 connectivity, addressing and routing
- Operations
- Obligations/requirements for a Tier1/2/3 to join
  - Security aspects
  - Costs and funding

  then a workshop with all interested T2s

- lhcopn-T2s-connectivity-wg <lhcopn-T2s-connectivity-wg@cern.ch>
- https://twiki.cern.ch/twiki/bin/view/LHCOPN/T2sConn

Tier2 traffic

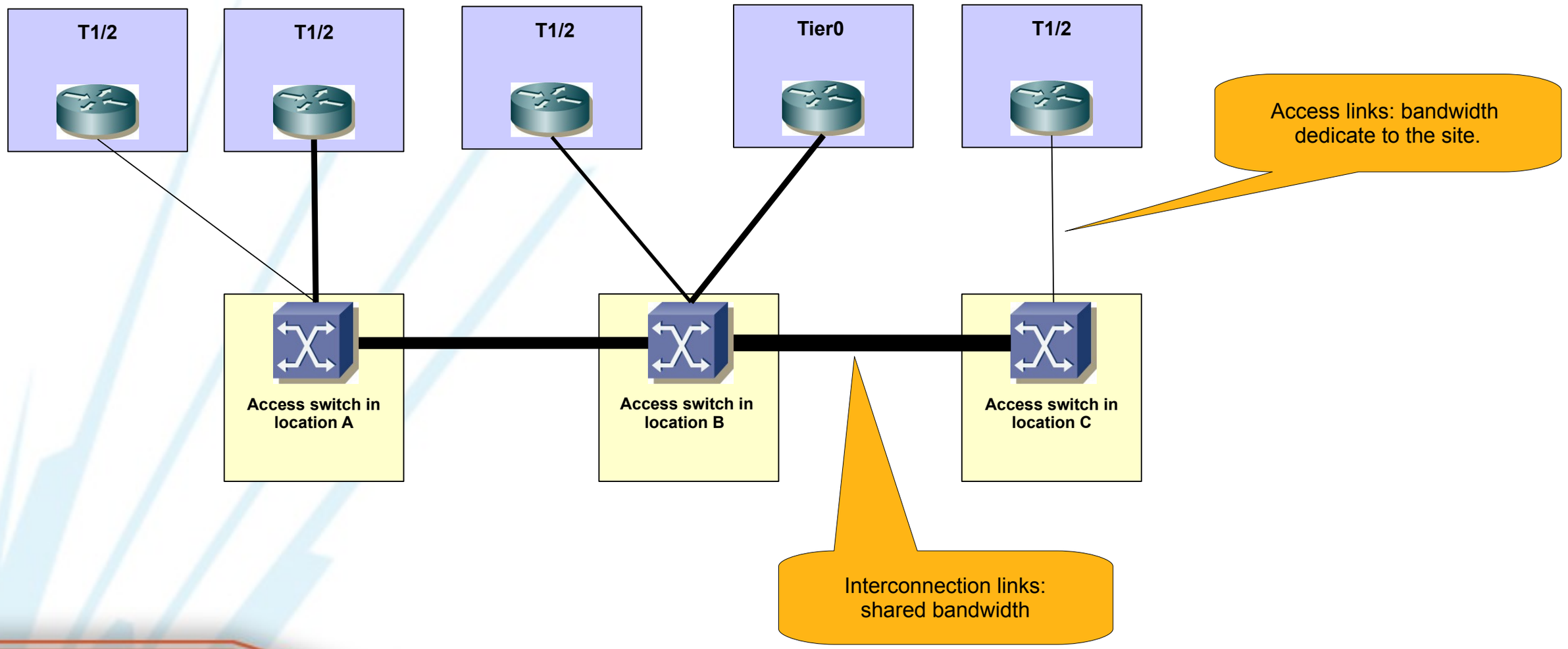
T2 traffic from 1 to 10Gb/s

- Local connectivity to RENATER
- National traffic
- International / transatlantic traffic

- Generic IP network / special purpose network ?
- The most likely outcome is going to be an architecture of exchange points that T2's can connect to, to improve their bandwidth to generally other T2's and T1's.

Distributed IXP

- A few strategic access locations interconnected with fat pipes.
- Provides connectivity among all members
- Flexible access: everyone can set they own preferred routing policy with anyone else, with the bandwidth they need/can_afford.



Shared Infrastructure

Hardware:

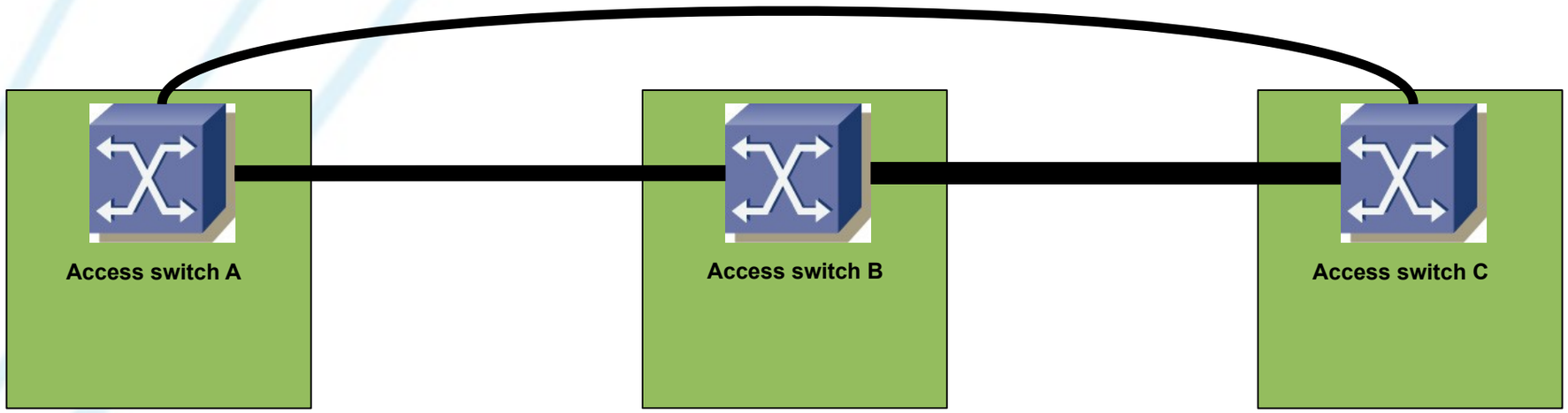
Layer2 switches with 1/10(/40/100)Gbps Ethernet interfaces in each location

Connectivity:

multiple aggregated 10G Ethernet links (40G and 100G Eth when available)

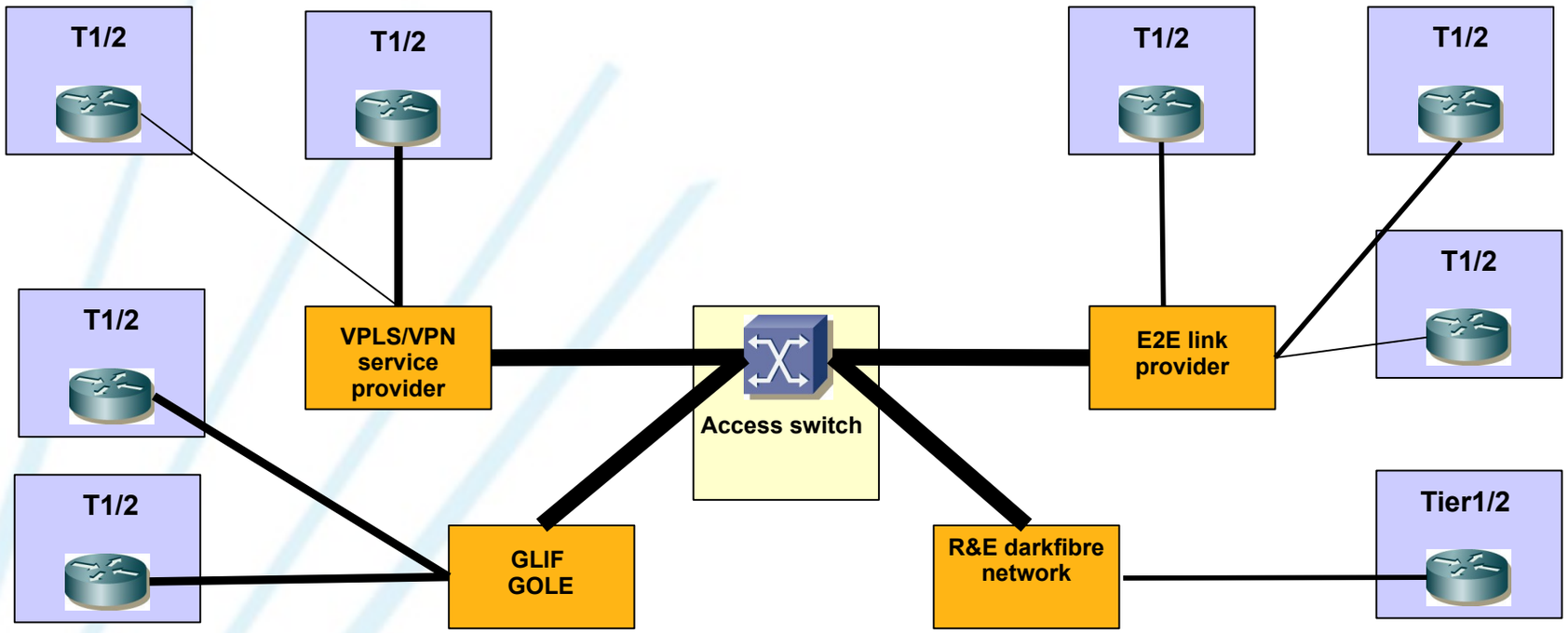
Redundancy:

A redundant topology should be envisaged (ring, for example)



Access link

- Each member will have to organize and pay for their own access link
- Bandwidth of the access links may be increased as necessary
- Any kind of link provider may be used



Layer 3 connectivity

- Every member gets an IP address from a common subnet (v4 and v6)
- Every member is responsible to establish the routing with any other member (BGP is required).
- A route server may be envisaged