T0/T1 network meeting

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CERN

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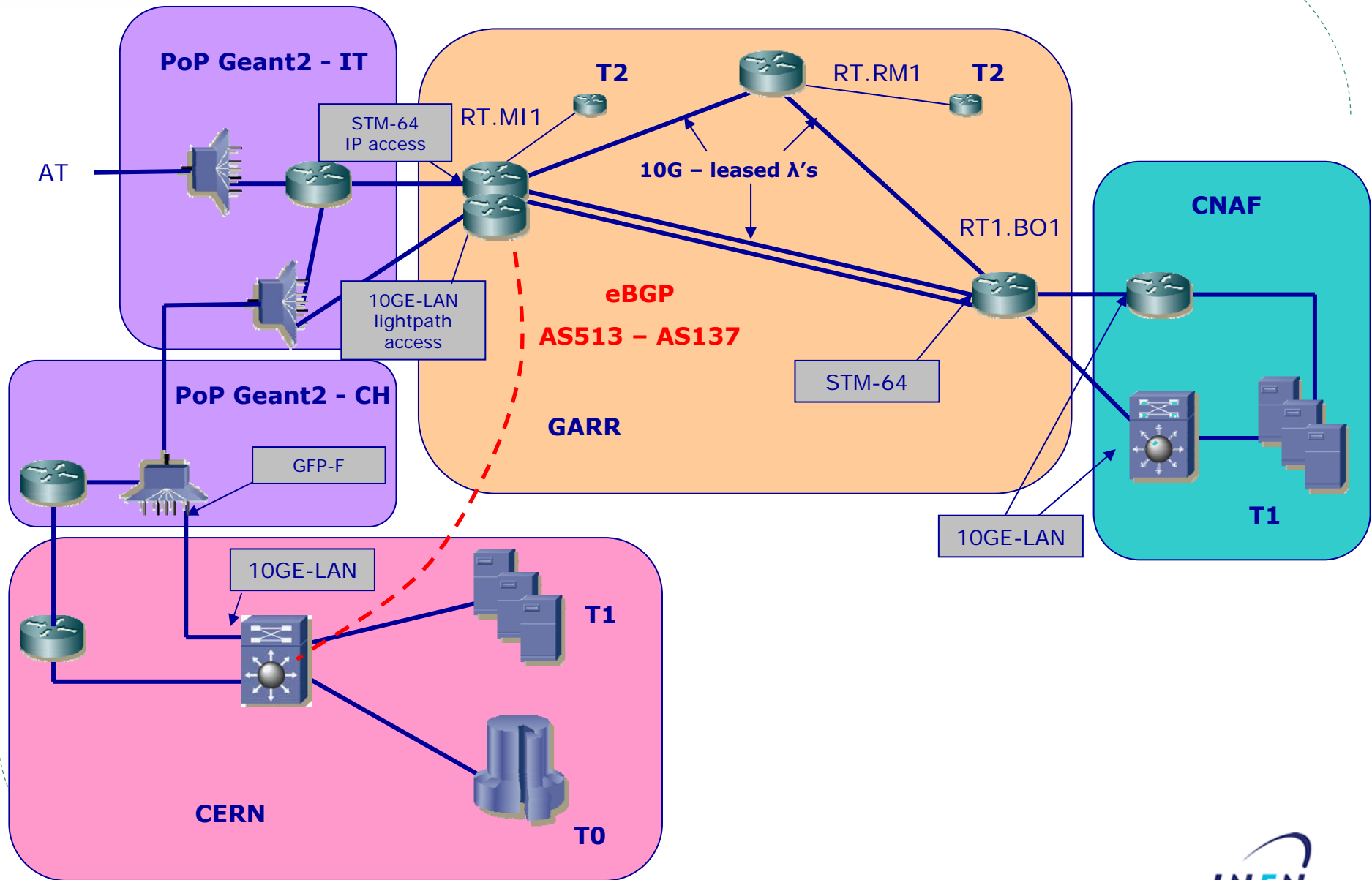
marco.marletta@garr.it

INFN Tier1 (1)

▸ Located at CNAF – Bologna

▸ Tier1 for all Alice, Atlas, CMS, LHCb experiments

▸ WAN connectivity with dedicated 10 Gbps to T0 provided by GARR (September 2005)
  – interface 10GE LAN PHY
  – backup 10Gbps possibly through other T1 (TBD)
  – AS number 137 (owner GARR)
  – Network prefix 193.135.23/24 (owner INFN)

INFN Tier1 (2)

▸ LAN connectivity based on 10GE technology with capacity for 10 GE link aggregation

▸ Data flows will terminate on disk buffer system (possibly CASTOR, but also other SRM systems under evaluation)

▸ Security model will be based on L3 filters (ACLs) within the L3 equipment

▸ Monitoring via snmp (presently v2)

Consortium GARR

T1 (*tbd*)

GARR

L1

L2

L0

L1, L2 links could be directly connected to BD

7600

Si

BD

192.135.23.254

192.135.23/24

T1+SC

SC→Datamover Cluster

4

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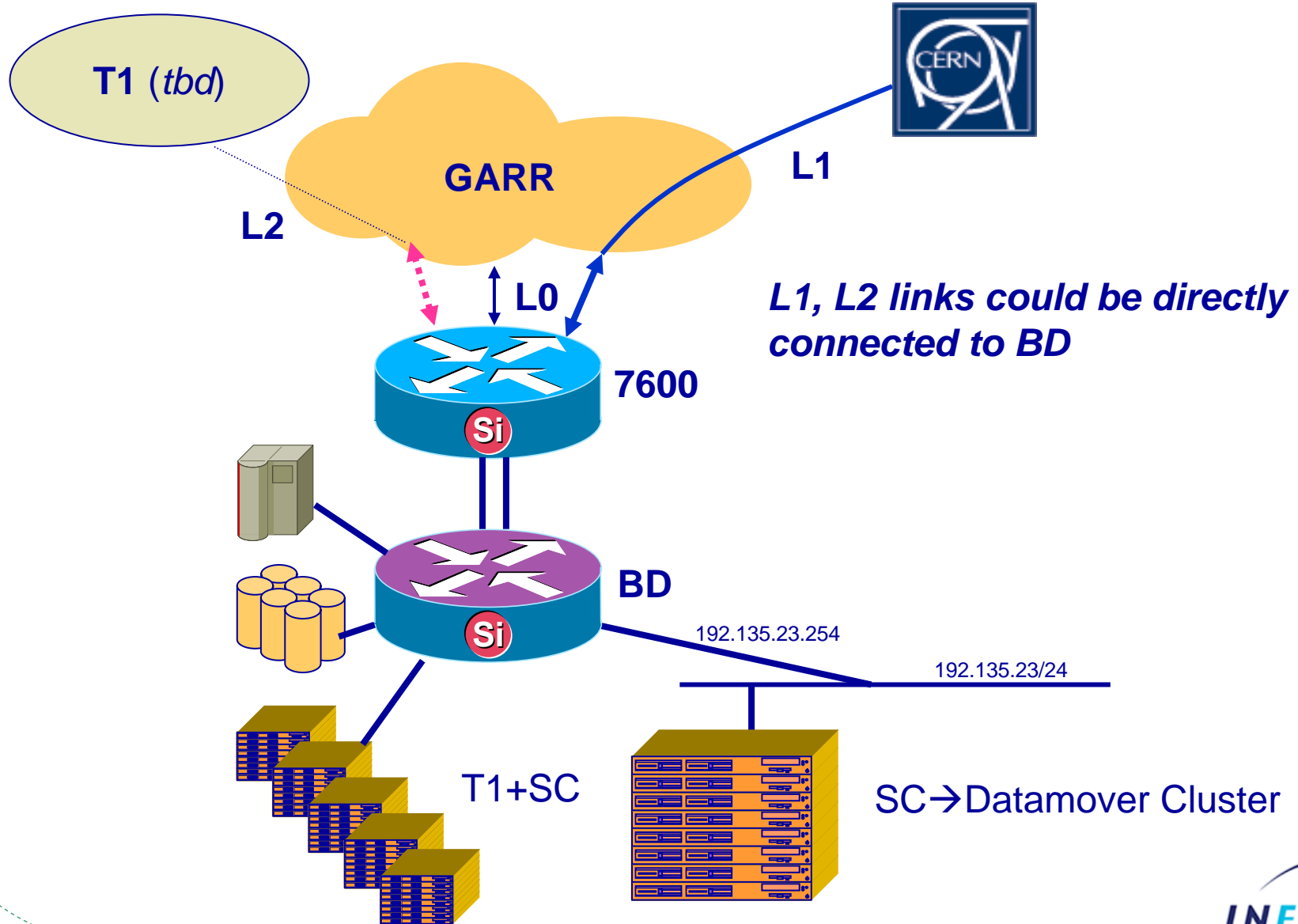
Italian LHC Architecture

PoP Geant2 - IT

T2

RT.RM1 **T2**

STM-64
IP access

RT.MI1

AT

10G – leased λ's

CNAF

RT1.BO1

10GE-LAN
lightpath
access

eBGP

AS513 – AS137

STM-64

PoP Geant2 - CH

GARR

GFP-F

10GE-LAN

T1

10GE-LAN

T1

CERN

T0

5

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Q&A - 1

Q1: In interpreting the T0/T1 document how do the T1s foresee to connect to the lambda?

A1: Via GARR equipment, 10GE-LAN PHY port

Q2: Which networking equipment will be used?

A2: GARR will use Juniper M320 now, SDH switch in future

Q3: How is local network layout organised?

A3: see previous slide

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Q&A – 2

Q4: How is the routing organised between the OPN and the general purpose internet?

A4: The italian T1 public IP address space will be routed at least to all Research Networks. Announcement to general purpose internet can be withdrawn.

Q5: What AS number and IP Prefixes will they use and are the IP prefixes dedicated to the connectivity to the T0?

A5: GARR ASN is 137, prefixes will be used to connect also to other T1 and T2

Q6: What backup connectivity is foreseen?

A6: GARR infrastructure will allow for national backup. International backup to be guaranteed via lightpath interconnection with other T1

Q7: What is the monitoring technology used locally?

A7: Good old L3 monitoring, via SNMP

7

Q&A - 3

Q8: How is the operational support organised?

A8: GARR NOC support is Mon-Fri, 8-20 CET (24x7x365 support tbd)

Q9: What is the security model to be used with OPN? How will it be implemented?

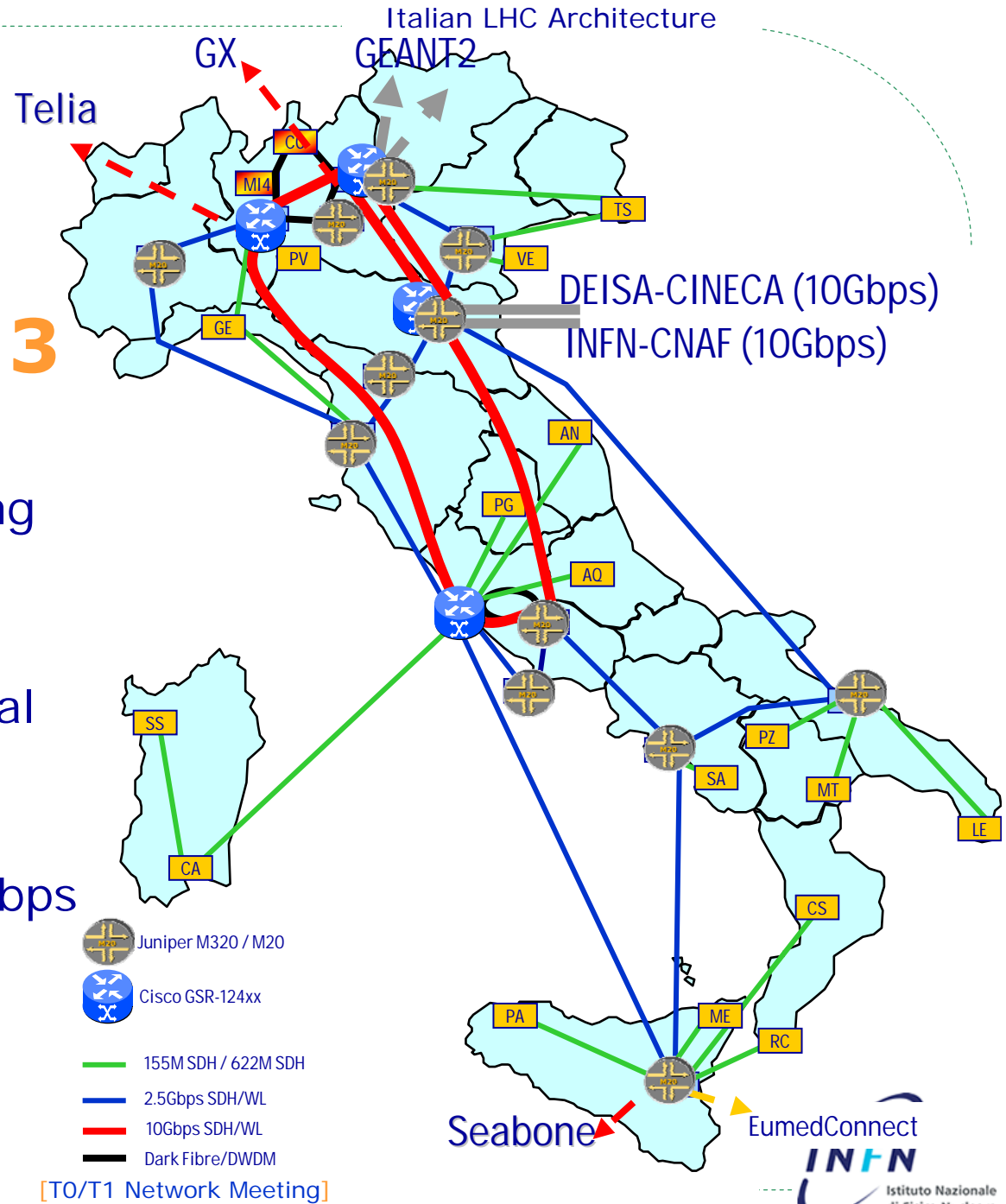A9: L3 and L4 filters can be implemented without performance impact

Q10: What is the policy for external monitoring of local network devices, e.g. the border router for the OPN.

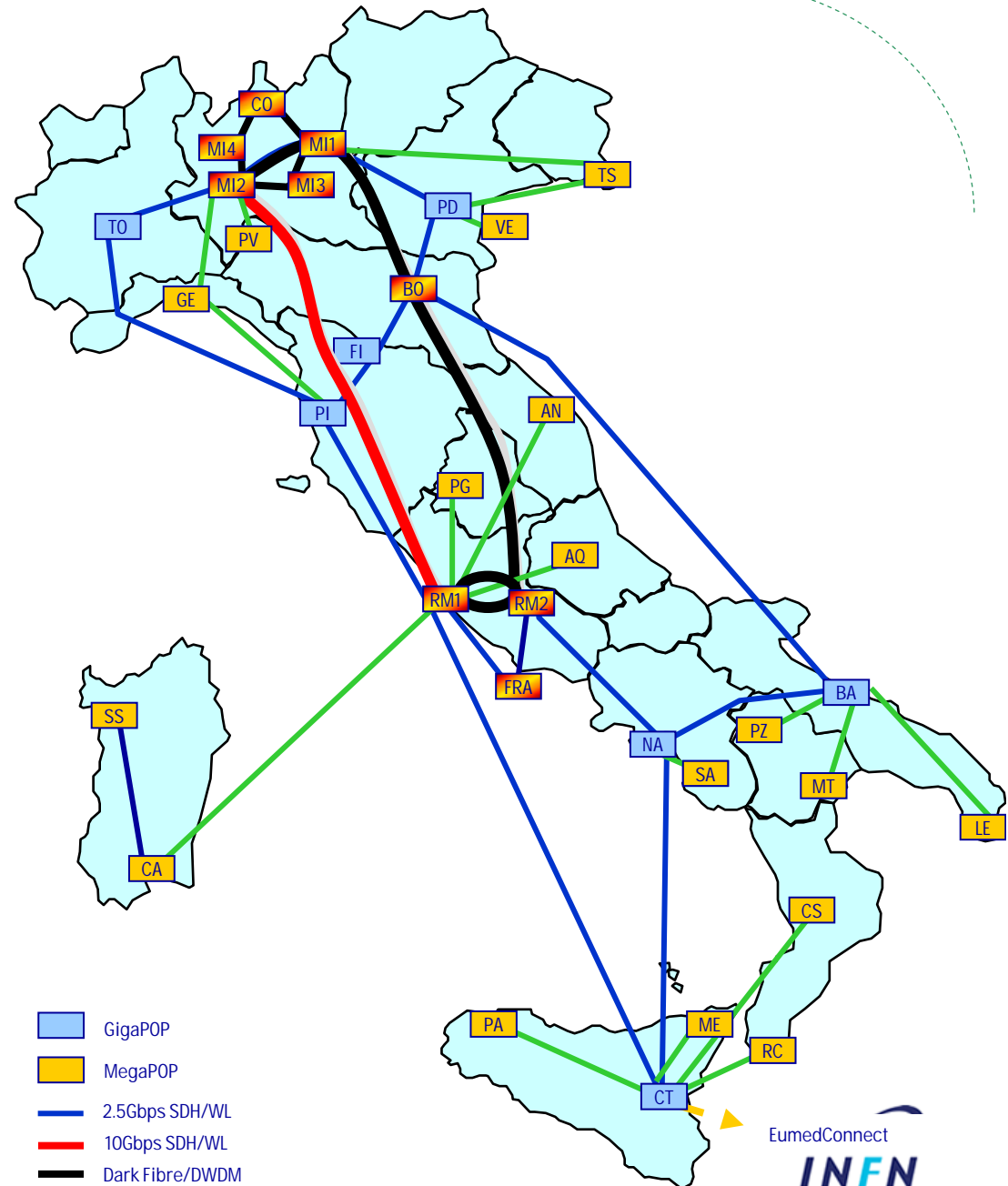A10: SNMP read-only access can be provided

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GARR-G Phase 3

- Implementation ongoing
- Completed Nov 05
- 10G lambdas
- 2x10G accesses, several 1G
- L3 infrastructure
- GEANT2 access: n*10Gbps (Sep-Oct 05)

GX
GEANT2
Telia

DEISA-CINECA (10Gbps)
INFN-CNAF (10Gbps)

Juniper M320 / M20

Cisco GSR-124xx

155M SDH / 622M SDH
2.5Gbps SDH/WL
10Gbps SDH/WL
Dark Fibre/DWDM

Seabone
EumedConnect

CO
MI4
PV
TS
VE
GE
AN
PG
AQ
SS
CA
PZ
SA
MT
LE
CS
PA
ME
RC

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9

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GARR-G Phase 4

- ▸ Next generation network

- ▸ Roma-Bologna-Milano ring

- ▸ 1000 Km total fibre length

- ▸ Owned optical infrastructure

- ▸ DWDM: 4x10G initially on each span

Legend:
- GigaPOP
- MegaPOP
- 2.5Gbps SDH/WL
- 10Gbps SDH/WL
- Dark Fibre/DWDM

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10

EumedConnect

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