

Geodetic Italian VLBI: first tests

Matteo Stagni - EVGA 2015 18-05-2015

Italian baselines

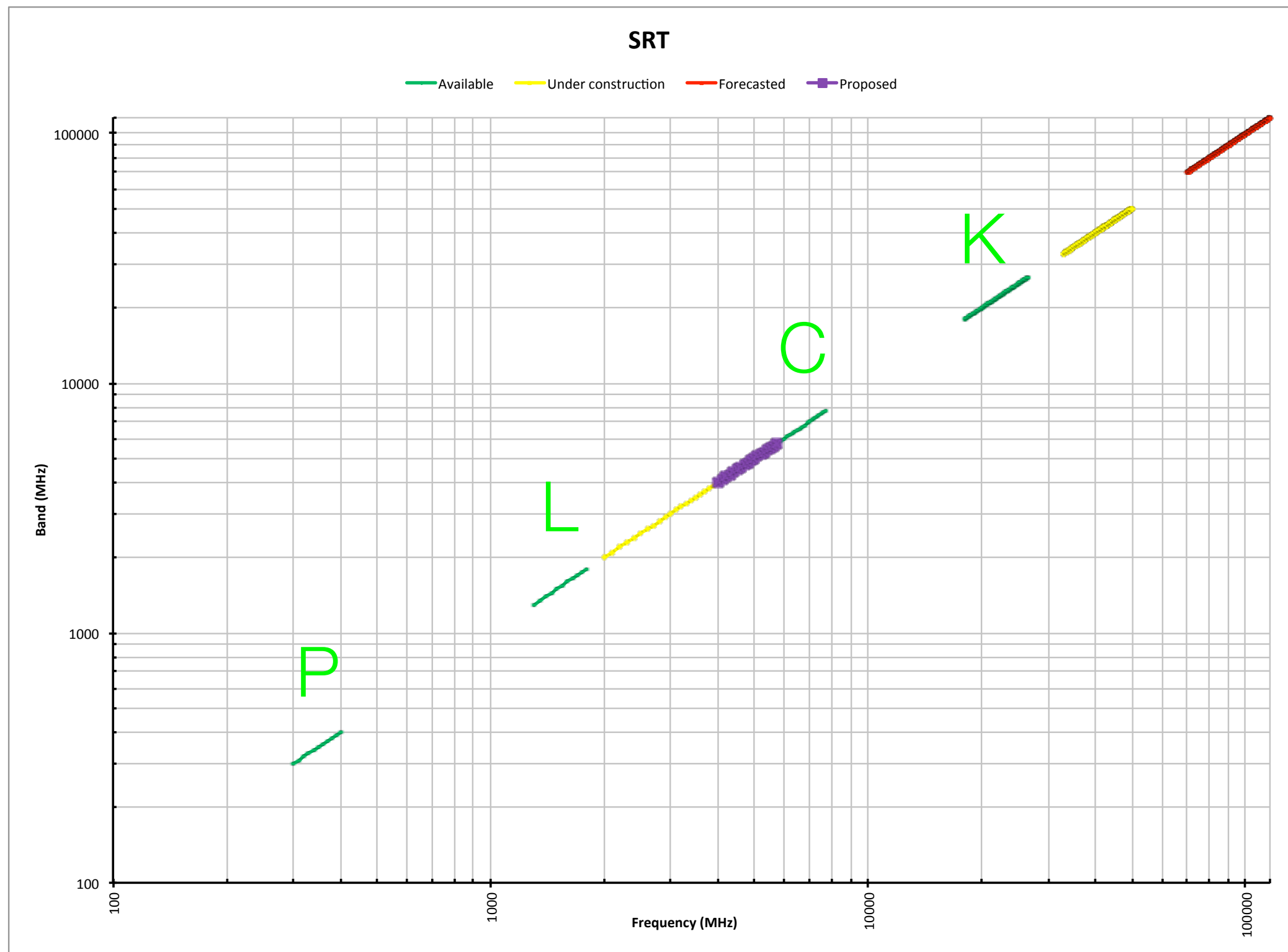
- Mc - Nt - Mt baselines for Geodetic experiments
- Mc - Nt - SRT baselines for Astronomical experiments
- Shortest baseline 500 km
- Longest baseline 900 km





SRT

64 mt diameter antenna
Active surface
0.3 -- 100Ghz
high tracking speed

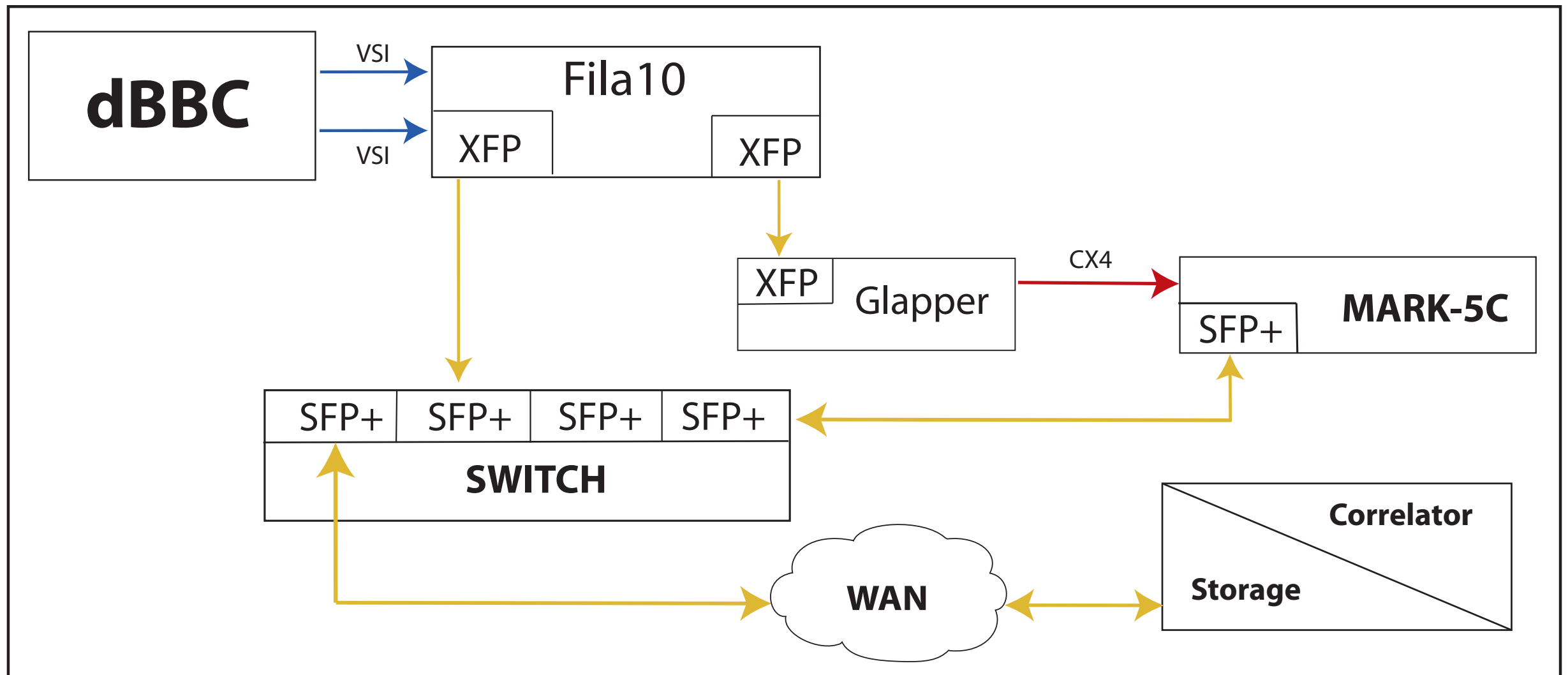


SRT

Receivers

	Antenna	Backends	Recorders
	Mc - 32 mt	dBBC	Mark5C
	Nt - 32 mt	dBBC	Mark5B
	SRT - 64 mt	dBBC	Mark5C
	Mt - 20 mt	VLBA	Mark5B

		Antenna	Now	2016
		Mc - 32 mt	10 Gbit/s	10 Gbit/s
		Nt - 32 mt	10 Gbit/s	10 Gbit/s
		SRT - 64 mt	-	10 Gbit/s (?)
		Mt - 20 mt	500 Mbit/s	-
		IRA - HQ	10 Gbit/s	10 Gbit/s

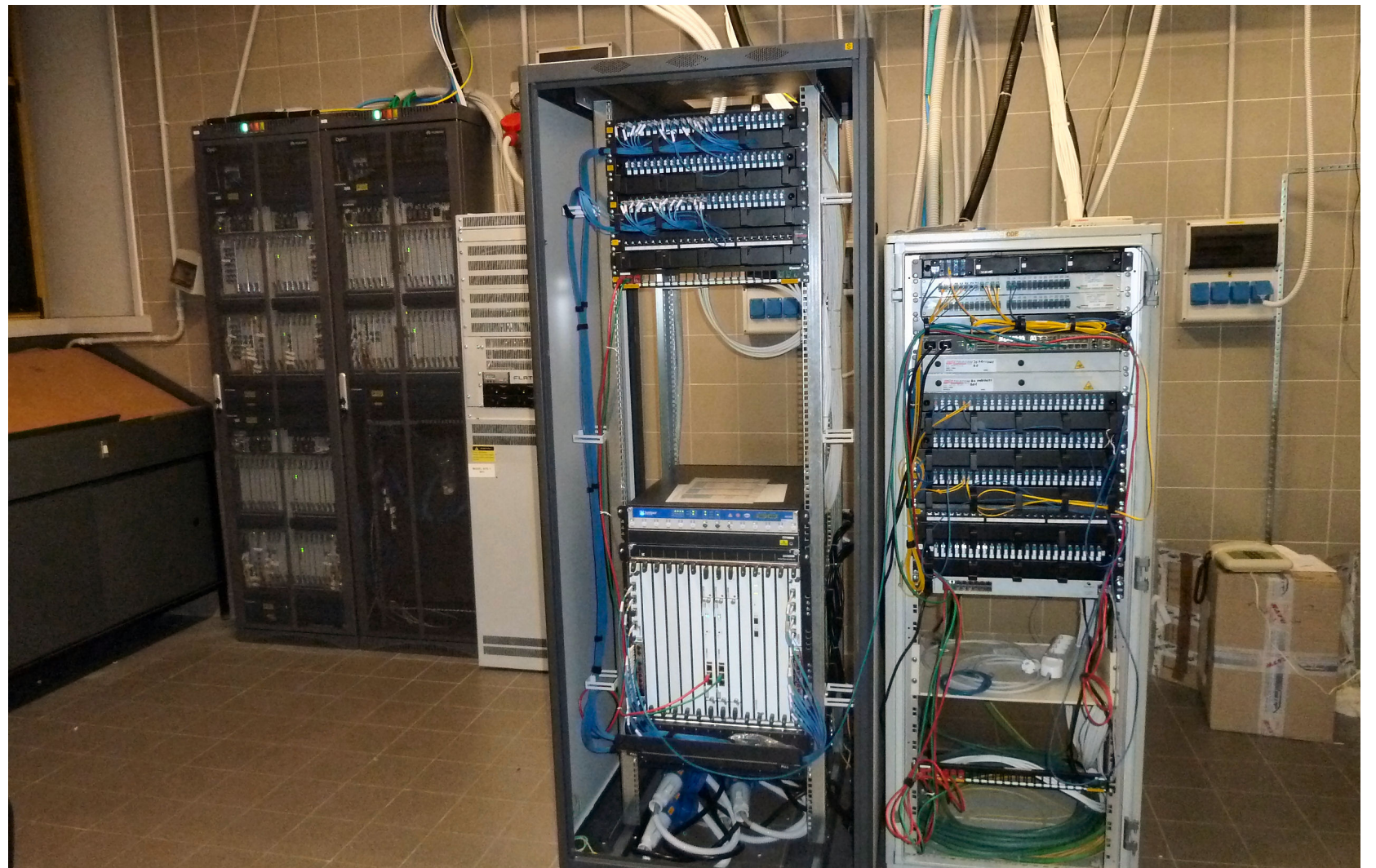
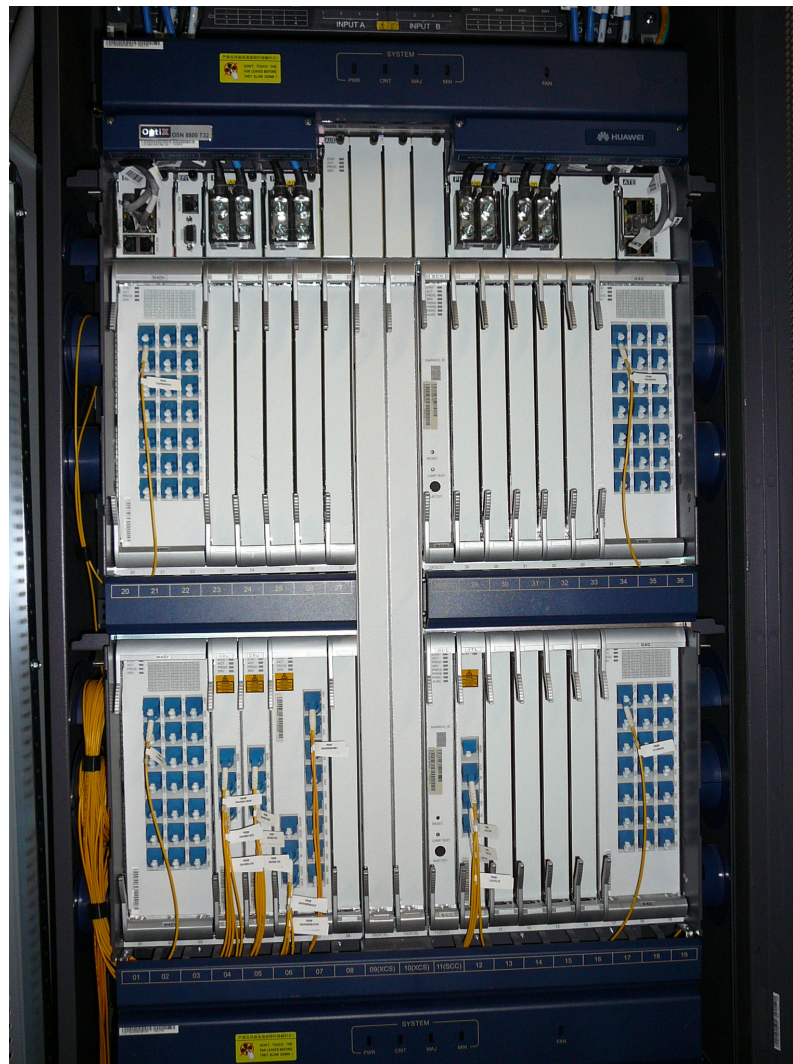


Network layout at stations

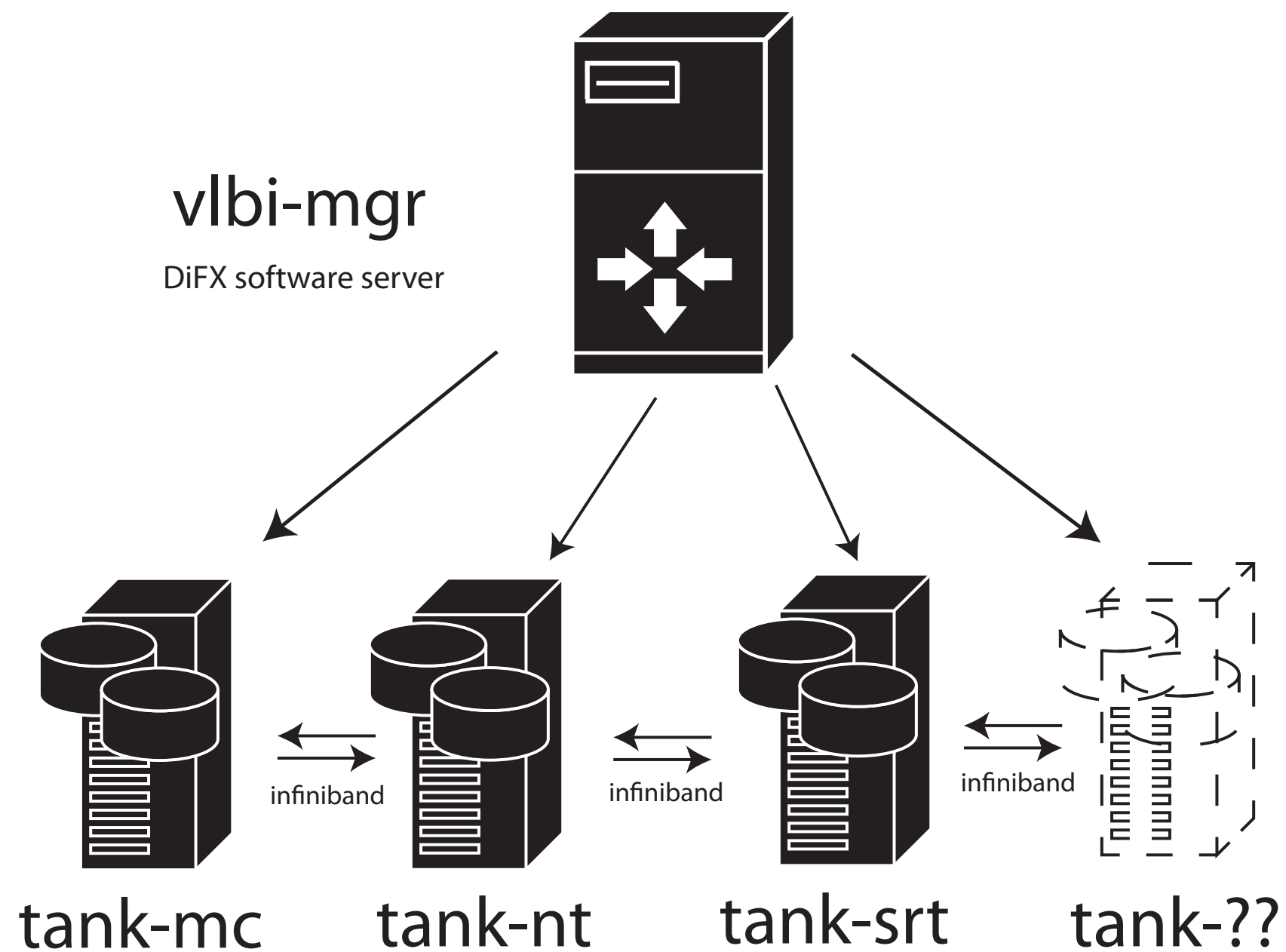
Fila 10 G

- The Fila board (**F**irst - **L**ast) is connected to the dBBC backend through a VSI cable and transfers the data onto an optical fiber adding a Mark5B or VDIF header





Juniper POP and Huawei Lambda DWDM devices



Cluster Architecture

A dedicated storage node
for each antenna

Cluster view

Infiniband connection

10 Gbit network

16 cores each

24 disks bay

Now 150 TB available
(20 TB SATA + 30 TB SAS each)



1 hr recording test @ 4 Gbit

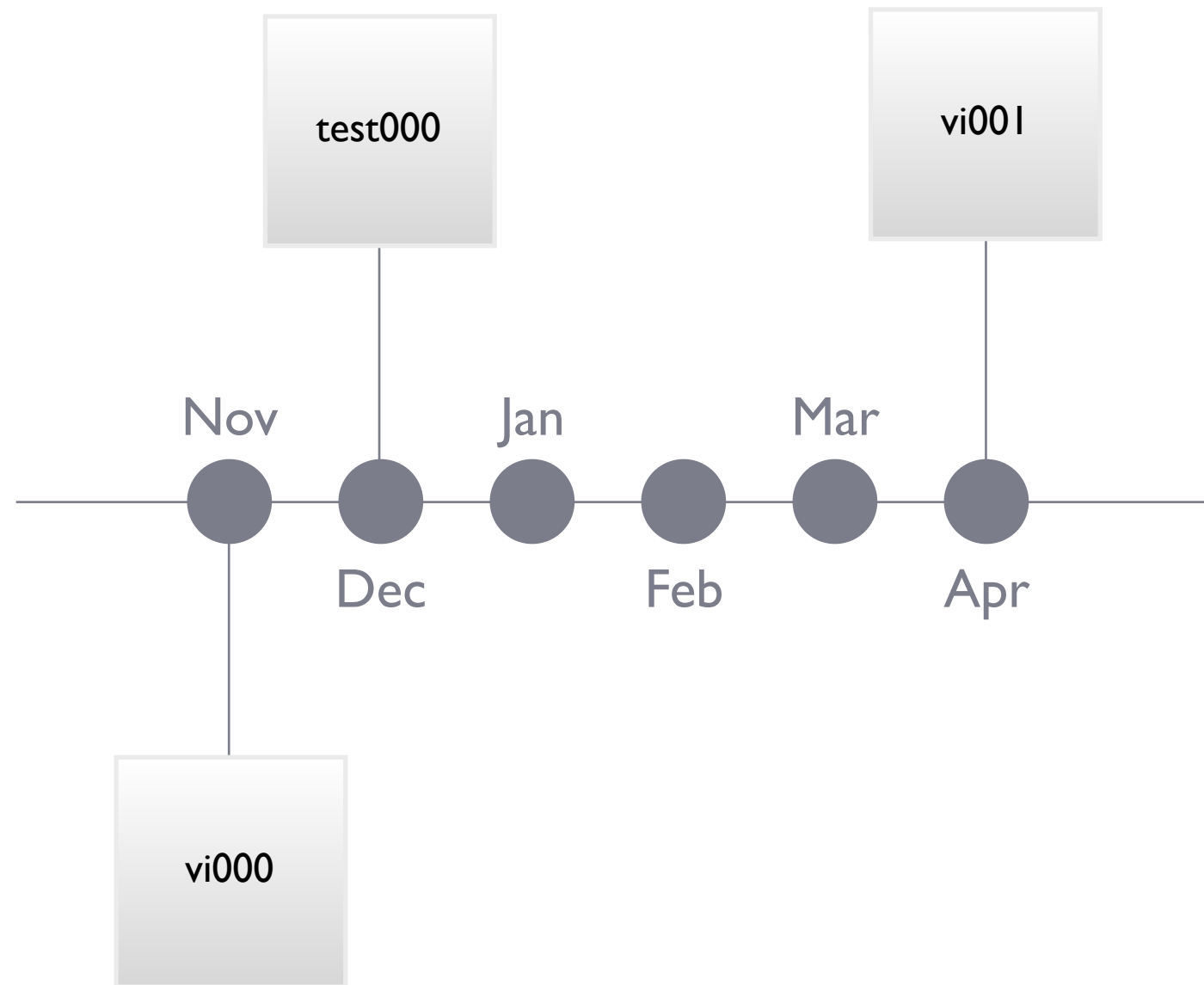
Medicina -> Bologna

5008 bytes Mark5B - Fila 10 G split packets	SATA RAID 20 TB	SAS RAID 30 TB
Lost packets	5102688	56782
Total packets	363651840	369577856
% lost	1.4 %	0.01 %

Thanks to Harro Verkouter's **jive5ab**

2013 - 2014

Timeline :: **GEO** experiments



Correlation

Trial and errors

- vi000 -> .skd file mistaken at Matera because the same as previous test
- test000 -> First half of experiment lost due to recording problems at Noto station
- vi001 -> Noto station experiences major failures

test000

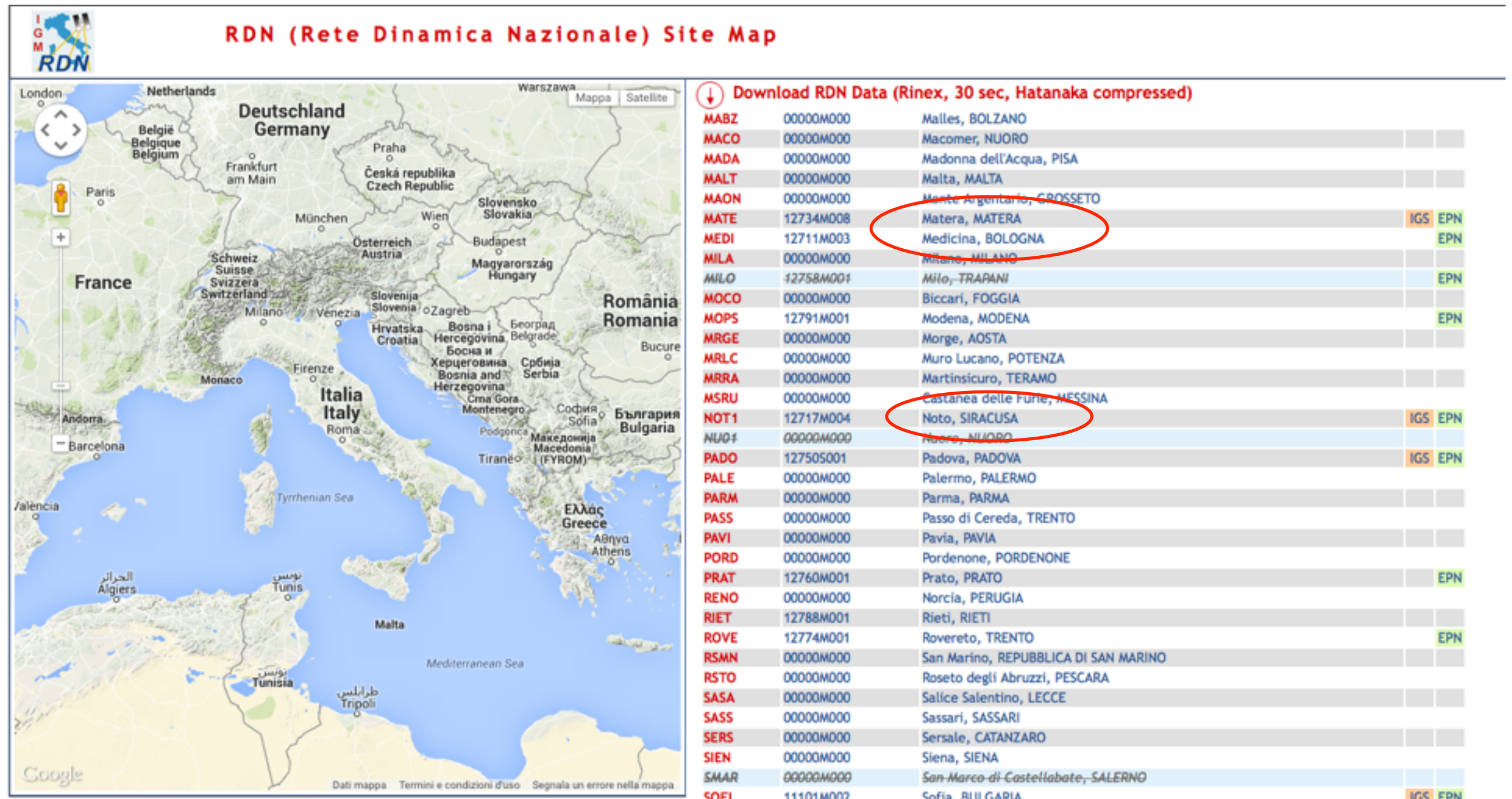
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Why Geo experiments?

- Roma 1940
- European Datum 1950 (ED50)
- World Geodetic System 1984 (WSG84)
- RDN (Dynamical National Network)

**Integration with existing datum when capable of
regular experiments**

Why Geo experiments?



RDN GPS receivers at the VLBI stations

Why Geo experiments?

- Test new dBBC backends GEO setups
- Thinking about distributed correlation

A distributed multi-PC system is particularly attractive for real-time observations since it avoids the network congestion issues inherent with a centralized correlator.

cit.VLBI2010:Current and Future Requirements for Geodetic VLBI Systems, 2005

Thank you

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