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# Virgo computing and storage needs for 2011

VIR-0557A-10


Virgo Collaboration


# 2011 runs forecast

- **VSR3/S6 just ended (yesterday)**
  - commissioning break until Christmas
  - take data in astrowatch mode (nights+week-ends): VA3 run
  
- **VSR4 (schedule still under discussion):**
  - Minimal sensitivity request not yet defined
  - start early January 2011 until adv Virgo shutdown (mid 2011)
    - > 6 months run**
  - Virgo will be the only IFO taking Science data in 2011 (adv LIGO shutdown and GEO in route towards GEOHF). GEO might be in astrowatch mode as well.

# Storage situation in CCs

- Data transferred:
  - Virgo : **rawdata**, **h(t)**, **50 Hz**, **trend**, **RDS (Reduced Data Set)**




small fraction of the total.
  - LIGO data: H1 and L1 h(t)
  - During runs data are transferred with a very low latency for rawdata and h(t) files (< 1 day)
  - Virgo astrowatch data: between runs data are acquired. Virgo set to Science during nights and week-ends. Data are saved in case of an interesting external trigger.
- Data are stored in both computing centers (Bologna and Lyon) in assure backup.
- Data are transferred using bbftppro (CNAF) and SRB (Lyon)

# Data access / storage

2 different strategies:

- Lyon:
  - **all data are in HPSS**. Access is granted through XrootD and SRB. Most recently accessed data are in XrootD cache disk. Solution is POSIX compliant and provide a good quality of service. Users are on average satisfied with data access (although sometime jobs fail because of data access error).
- Bologna:
  - **most recent data on gpfs disk + old data moved manually to tapes (CASTOR so far)**
  - disk must be large enough to store the most recent data: VSR2 + VSR3 in 2010. These 2 runs are still actively analyzed by Continuous Waves and Compact Binary Coalescence groups.
  - data on tapes are not accessed.

# Virgo storage

- Lyon:

Year	HPSS (TiB)	XrootD cache (TiB) used / available for Virgo	SRB cache (TiB) used /available for all experiments	sps (TiB) used /available for Virgo
2009	317	109 / 184	32 / 106	1.1 / 5.4
Request for 2010	+ 140	+124	0	0
2010 (oct 1st)	399	162 / 184+124	32 / 203	3.6 / 5.4
Given what needs to be transfered and activities until the end of the year, the free space estimated by the end of 2010 is				
Free space end of 2010	0	~100	No change expected	No change expected

Conclusion: all is OK

- Bologna:

Year	Gpfs 4 (TB) used / available for Virgo	Gpfs 3 (TB) used / available for Virgo	CASTOR (TB) used / available for Virgo
2009	190 / 256	9 / 16	145 / ?
Request for 2010	+186	0	+20
2010 (oct 1st)	261 / 256+186 = 442	16 / 16	163 / 165
Given what needs to be transfered and activities until the end of the year, the free space estimated by the end of 2010 is			
Free space end of 2010	~110	0	2

Conclusion: all is OK

# Virgo storage for 2011

- VSR4 run : not yet defined, but assuming a 6 months run Virgo will acquire ~200 TB
- Given the end of 2010 free space Virgo makes the following demand:
  - Lyon:
    - 200 TB in HPSS
  - Bologna:
    - 160 TB in GEMSS
    - Move data in CASTOR (all data up to VSR1) to GEMSS
    - Start moving VSR2 rawdata on gpfs4 to GEMSS
    - Provide data access to files in GEMSS (otherwise we need to keep VSR2 rawdata on disk)
    - +25 TB of user disk space (gpfs3)

# Virgo computing in 2010

Period	CNAF (HSE06.day)	CCIN2P3 (HSE06.day)
2010 request	1,280,000	1,220,000
2010 (oct 1 <sup>st</sup> )	220,000	122,000
2010 (forecast)	280,000	150,000

Consumption much smaller than foreseen

<-- over estimation

<-- some searches have been done on LSC clusters

# Computing in 2011

	CNAF/Bologna [HSE06.day]	IN2P3/Lyon [HSE06.day]
Continuous signals	400000	0
Burst sources	0	80000
Stochastic Background	0	0
Coalescing Binaries	30000	30000
Detector Characterization	4000	4000
<b>Total</b>	<b>434000</b>	<b>114000</b>

Upper limits given. CPU should be mainly used by CW searches