# 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):
  - Mininal 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 transfered:
  - 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 transfered 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 transfered 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 espected |

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)

# Virgo computing in 2010

| Period | CNAF (HSE06.day) | CCIN2P3 (HSE06.day) |
|---|---|---|
| 2010 request | 1,280,000 | 1,220,000 |
| 2010 (oct 1st) | 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 |
| Total | 434000 | 114000 |

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