



Detchar Status Report

Virgo detchar group

<https://wwwcascina.virgo.infn.it/DataAnalysis/Detchar/>

AdV. Preparation

- sub-system noise characterization
- hardware injections for detchar

Monitoring

- data interactive display
- detector monitoring
- sensors & channels
- online noise budget

Glitches

- noise investigation
- vetoes for searches
- impact on transient searches

Spectral noise

- noise investigation
- noise lines
- impact on CW/Stochastic searches

Scientific runs

- shifts
- GW alerts and follow-up

<https://www.cascina.virgo.infn.it/DataAnalysis/Detchar/shifts.html>

- A few detchar shifts were organized to investigate PSL/INJ noise.

- 2 shifters (glitch/spectral) working offline over week-end data. Reports are posted in the logbook

- Many goals:
 - investigate noise at the sub-system level
 - back in the business of looking at the data
 - pressure on detchar efforts: test/improve tools, identify needs
 - document tools/procedure for non-experts
 - organize interaction commissioning/data analysts
 - prototyping what future science run shifts will be

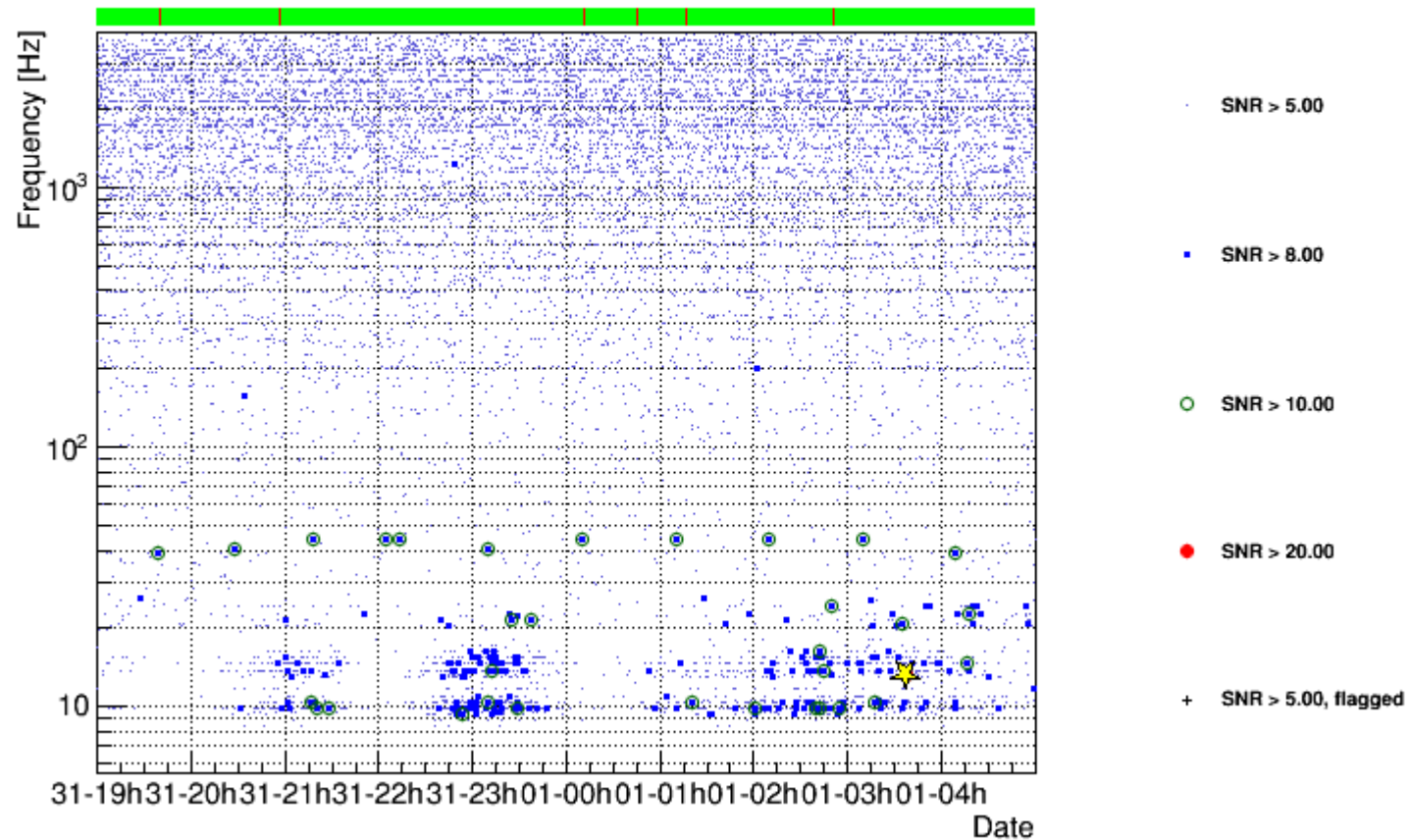
- So far, shifts are performed by detchar people.
Soon, we would like to open shifts to motivated people in the collaboration

2 channels were scrutinized:

- INJ_RFC_REFL_I (frequency stab.)
- PSTAB_PD2_AC (power stab)

→ Glitches: in general, the data was found to be rather “clean”

V1:INJ_RFC_REFL_I: cluster frequency vs. time (starts at 2015-Mar-31 18:59:58 UTC)

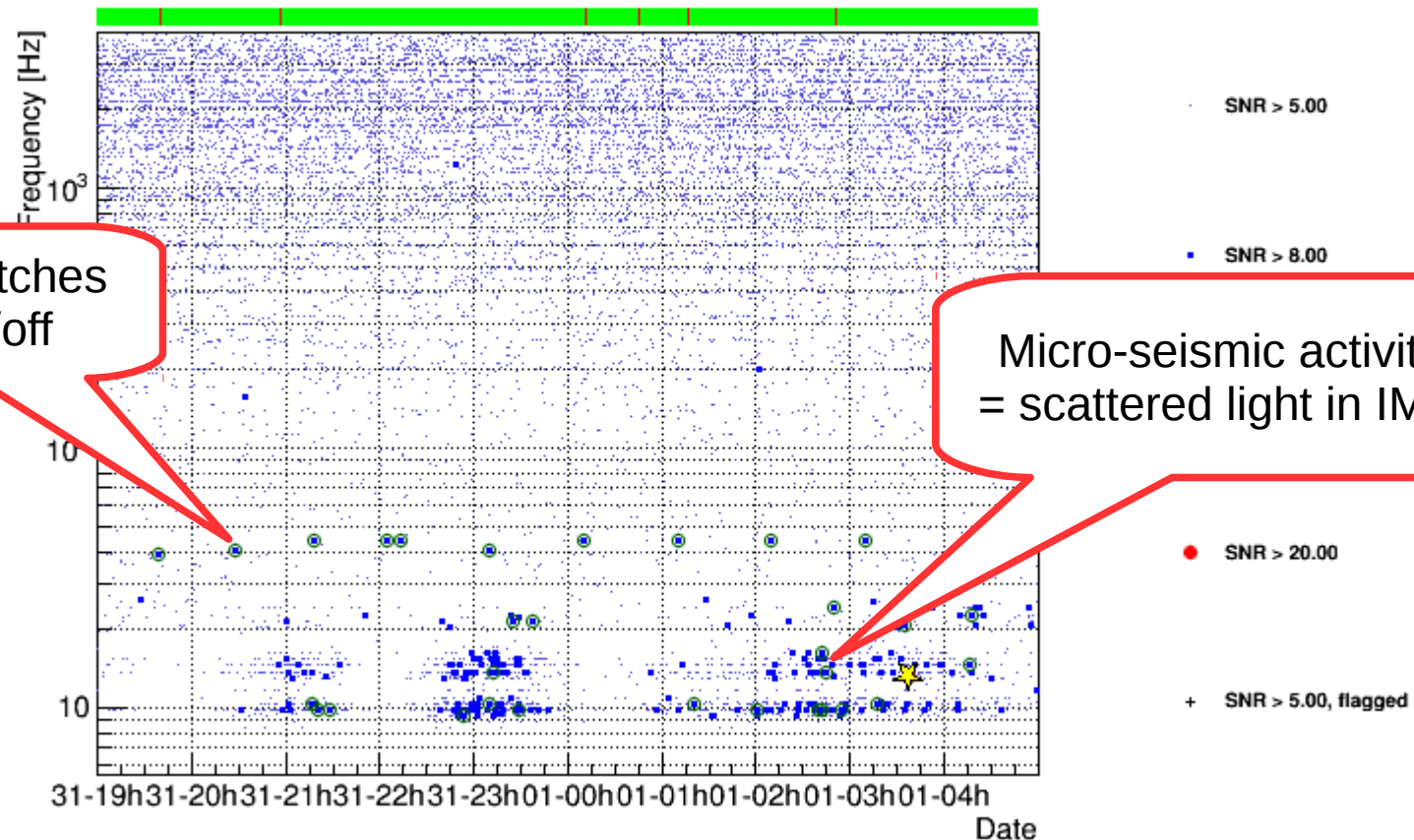


2 channels were scrutinized:

- INJ_RFC_REFL_I (frequency stab.)
- PSTAB_PD2_AC (power stab)

→ Glitches: in general, the data was found to be rather “clean”

V1:INJ_RFC_REFL_I: cluster frequency vs. time (starts at 2015-Mar-31 18:59:58 UTC)



Periodic glitches
= AC on/off

Micro-seismic activity
= scattered light in IMC

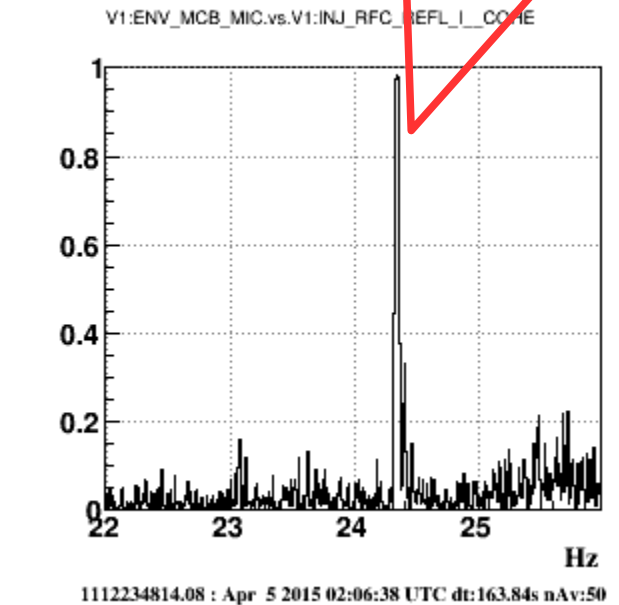
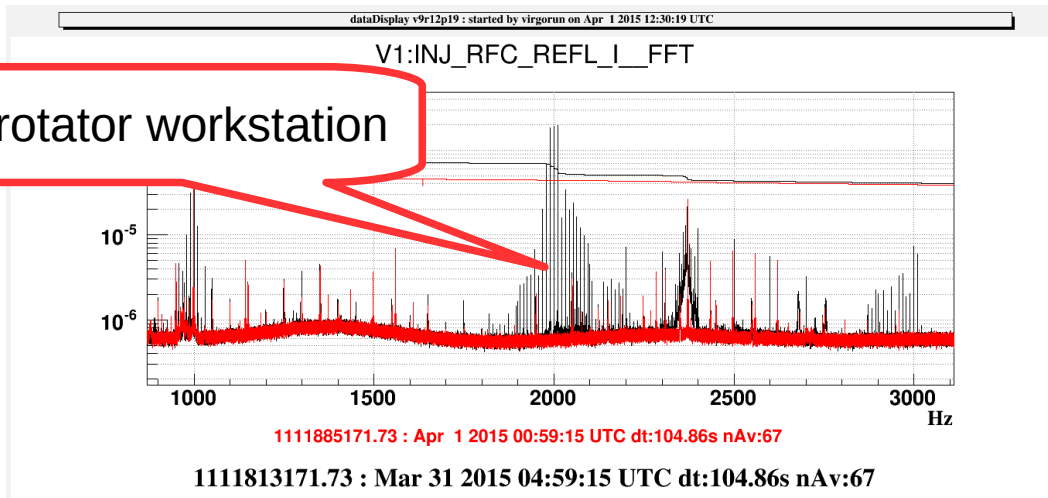
2 channels were scrutinized:

- INJ_RFC_REFL_I (frequency stab.)
- PSTAB_PD2_AC (power stab)

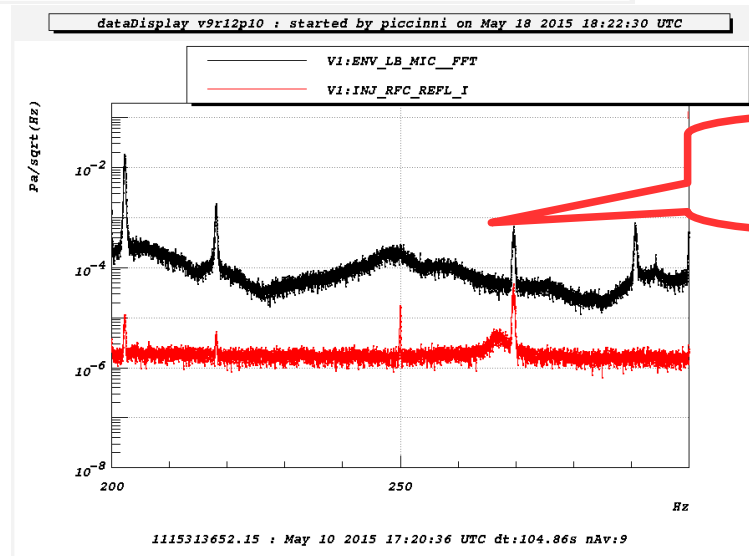
→ Spectral noise: many lines were identified

Coherence with a microphone
= vacuum scroll pump

SIB1 rotator workstation



Acoustic lines
= master laser cooling fan



The detchar group is writing a Virgo note to describe the data quality strategy and what data quality products will be delivered for future science runs

<https://tds.ego-gw.it/ql/?c=10982>

The “veto model” has been redesigned:

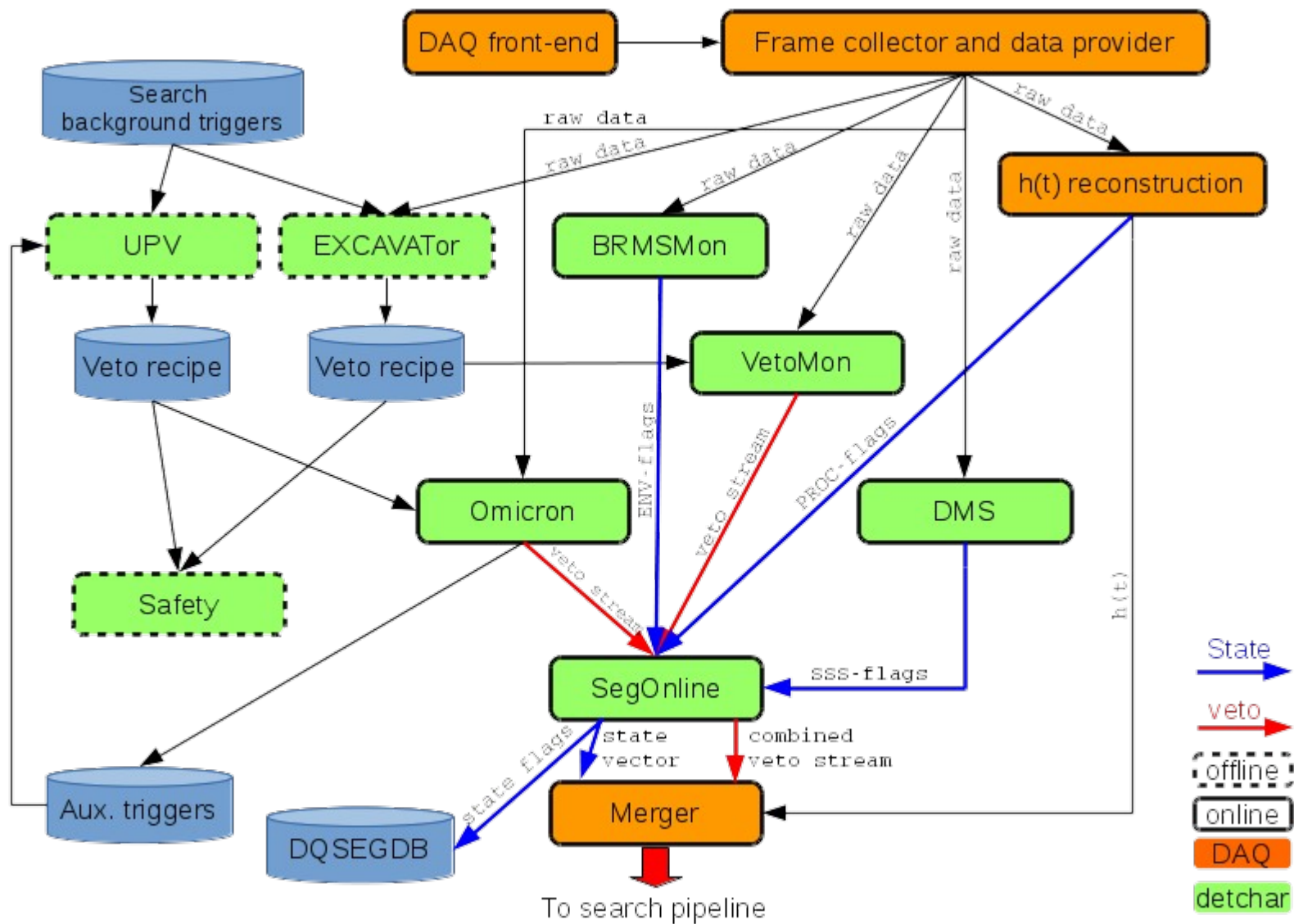
- more search-specific: 1 search = 1 set of vetoes
- more involvement from search groups: veto tuning, search trigger access
- new online architecture for veto production: “search veto channels”
- new veto storage: DQSEGDB

The “spectral model” is being developed:

- very similar to what was done in the past: NoEMi + LineDB

Implementation:

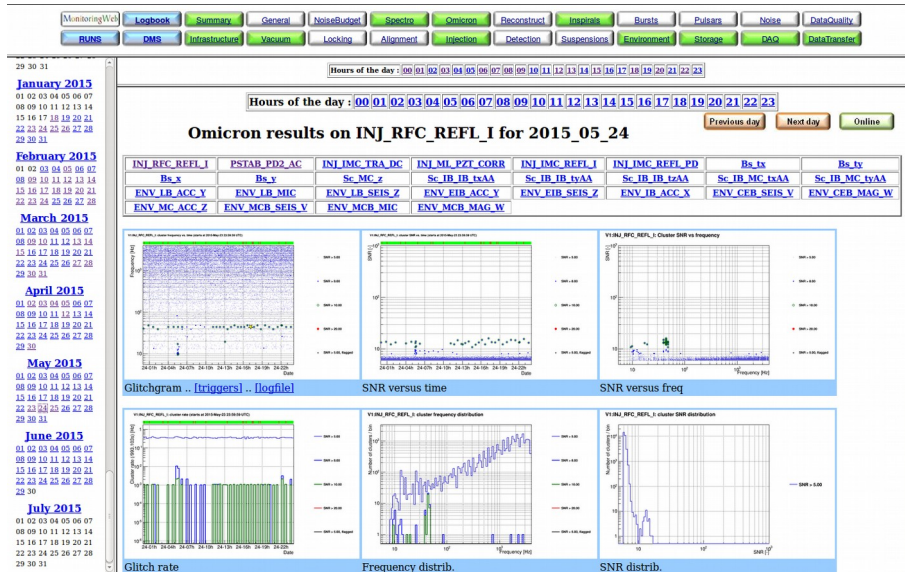
- tools already exists. They need to be improved to better fit the DQ model
- online implementation work is on-going
- veto tools are being improved



Other projects

Omicron (glitches) and NoEMi (lines):

Front-end analyses, essential for detchar noise investigation:

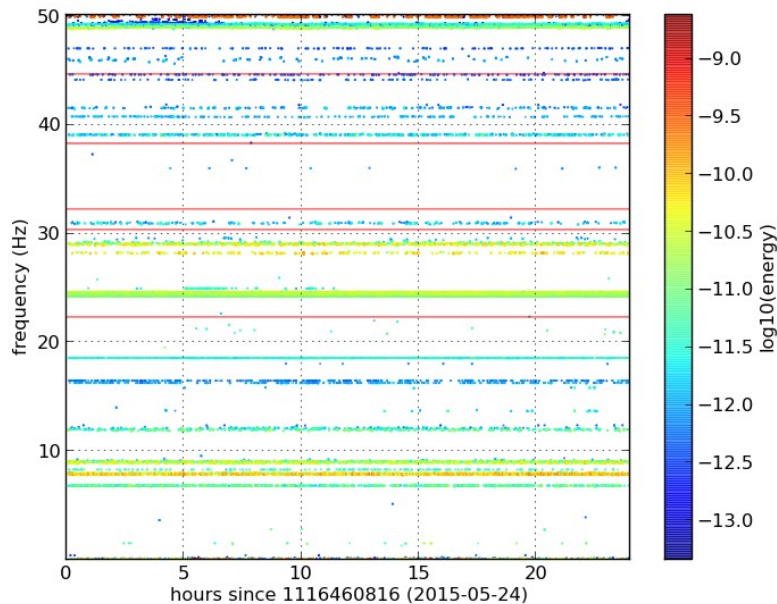


Omicron is running all the time over hundreds of channels

Triggers are produced with low latency (<20s)

A set of tools are available to access/plot triggers

Monitoring plots are displayed on the web



NoEMi is running all the time

Important channels are processed

List of lines are automatically produced for detchar investigation



MonitoringWeb: web interface to monitor the detector's data: trends, glitches, spectro etc...

- New web interface in preparation
- New modules will be added

Detector Monitoring System
 SHELVED PAGE v6r6
 UTC Tue Jun 30 08:51:04 2015 Latency: 2.95
 GPS 1119689480 Frame No: 129391

MUTE DMS (current status: NOT MUTED)
 Switch to UNSHELVED page
 Stop refresh
 Switch to internal view
 Contacts / HELP

Admin
 DMS flag list
 Alarm Log
 DMS / FLAG Log
 View XML files

ITF STATUS
 Mode: 7893 h 50 min
 Step: -1
 - AutoRelock: OFF
 - AutoScience: OFF
 - Horizon_NSNS_AVG: 0.0

Last event (2011-11-09 09:16:58 LT):
 Lock sequence reset

Flags produced by EnvMoni not anymore updated

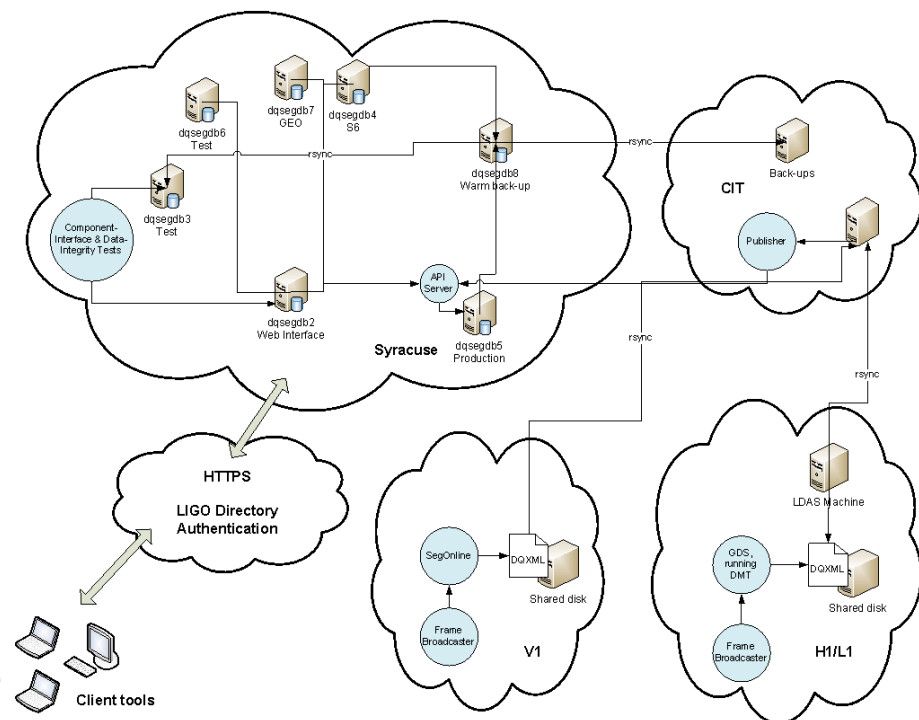
Injection	IB_ID	IB_Vert	IB_LC		
	MC_ID	MC_Vert	MC_LC		
	Laser	LaserAmpli	LaserChiller	LaserChillerDiodes	
	MC_Power	IMC_AA	RFC	BPC	FreqNoise
Environment	CB_Hall *	MC_Hall	WE_Hall *	DeadChannel_EE	
	INJ_Area	External	Env_ADCs	EERoom	EnvServers
Infrastructures	ACS_CB_Hall	ACS_INJ	ACS_DET*	ACS_TB	ACS_MC
	UPS_TB	UPS_MC	UPS_NE	UPS_WE *	Generator
Vacuum	OSRboot	TubeServers	TubePumps	Pressure	CompressedAir *
					CryoTrap
					1500N
VPM	DetEnvMon	DataCollection	DataAccess	Automation	Injection
	ControlRoom	DetectorMonitoring *	DetChar	Miniblowers	Storage

DMS: web interface to monitor the detector status

- tool shared by many groups
- For detchar: DQ state flags provider
- work is ongoing to transfer flags in DQSEGDB

DQSEGDB: database for DQ segments

- LIGO-Virgo joint project
- New design based on segdb + VDB experience
- DQ segments from past runs have been transferred
- Adv. LIGO (ER) flags are uploaded
- Adv. Virgo flag upload tests were successful
- Backup procedure is up
- Web interface ready, including monitoring tools
- Daily Component-Interface & Data-Integrity checks automatically run
- Problems with command-line clients (incompatible with Cascina env.)



VIC: Virgo channel database

- Designed from scratch
- Past channels have been uploaded
- Automatically updated: frame scan once a day
- Web interface in preparation
- Channel description manually uploaded

Please! Follow the new channel naming convention:

<https://tds.ego-gw.it/ql/?c=10250>

- Progress with the current detchar projects (MonitoringWeb, VIC, DQSEGDB...)
- More detchar shifts whenever we have fresh data. Volunteers are welcome!
- Noise investigation of new sub-systems
- Training sessions where sub-systems will be described for detcharians/operators (next: INJ)
- Plans for hardware injections for detchar : what, when, how often, how loud...
- Implementation of DQ model: online monitors, veto production
- Joint detchar meeting with LIGO: develop common strategies