# Toward a common Gravitational Wave detectors distributed cyber infrastructure

Gravitational Wave detectors data are acquired at the observatories where they are processed locally to characterize the detector and allow timely identification and correction of problems within the instruments. Calibrated data are transferred over a dedicated low-latency network to computing clusters were triggers must be produced within seconds, in order to enable multi-messenger observations.

Data are also transferred to external Computing Centers (CCs) where deep searches and large-scale simulations are subsequently undertaken over timescales ranging from a few days to many months. The geographical separation of the detectors and the different timescales involved imply the creation of a common distributed cyber infrastructure which must guarantee:

- adequate storage and computing resources, for commissioning, detector characterization and low-latency searches
- fast communications among the different observatories and computing clusters for low-latency searches
- reliable bulk data transfer to custodial storage in CCs
- an ubiquitous and uniform running environment for off-line deep searches on dedicated resources and heterogeneous infrastructures
- an homogeneous model for data distribution, bookkeeping and access

Achieving those goals imply the definition of common tools, services and standards in order to guarantee interoperability and minimization of development and maintenance effort.

We will report about this ongoing coordination effort between the LIGO and Virgo Collaborations Computing and Software groups entering into the technical details of the existing and envisioned common solutions.