GNSS data integration into seismological standard workflows

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Why discussing about GNSS at FDSN?

- Various groups operating also GNSS stations co-located with seismic
- Demand to handle and archive data also in seismological formats
- New developments in the GNSS community with high precision real-time GNSS data streaming
- Wish to integrate real-time GNSS data streams in existing processing pipelines
- How to fit GNSS data into our standard data and metadata format?
- Alternatives: HDF5 and SensorML
- How to move forward in a coordinated way within FDSN?
Recent developments at GFZ

- Started working on real-time integration in SeisComP in the context of a national project with focus on tsunami early-warning; Geodesy section producing a new real-time GNSS format named GDRT
- Stakeholders are tsunami warning centers willing to have the high precision real-time GNSS streams integrated in the processing pipeline
- Improvement of Moment Tensor solutions when GNSS stations are available in the near field and integration into GUIs of Decision Support System
And at other European Data Centers

- Displacement waveforms available for source inversions/MTs/Tsunami. Generally, near real-time and past waveforms available for seismological purposes/services
- Growing number of co-located GNSS/BB/SM and at some locations also rotational sensors
- Questing for solution for naming conventions and appropriate metadata
- Need a simple and coordinated way to include GNSS data into the real-time processing pipelines of early warning and rapid response systems (tsunami warning, volcanic monitoring, e.g. magma inflation etc)
- Attempt to include GNSS in miniSEED and stationXML to at least accomplish the real-time processing without curating raw data (only derived)
Moving forward in synergy within the FDSN?

- A) Need to identify an effective and unified approach for the short term. This should be based on the current formats (with limitations). At some institutions already working with the real-time processing.
- B) Start discussing a long term solution exploring also usage of other formats more suitable e.g. HDF5 and SensorML

Proposed approach

Identify the groups within the FDSN that are already working on this topic and together prepare a white paper about the GNSS data integration in Seismology

Based on that document develop some guidelines to address the immediate needs (short term) and start a discussion within this group for the long term options.
Thanks for your attention!

Who is willing to contribute or interested in this topic?

Collect names/institutions in order to organise a dedicated meeting later to discuss how to organise and proceed.