

# GNSS data integration into seismological standard workflows

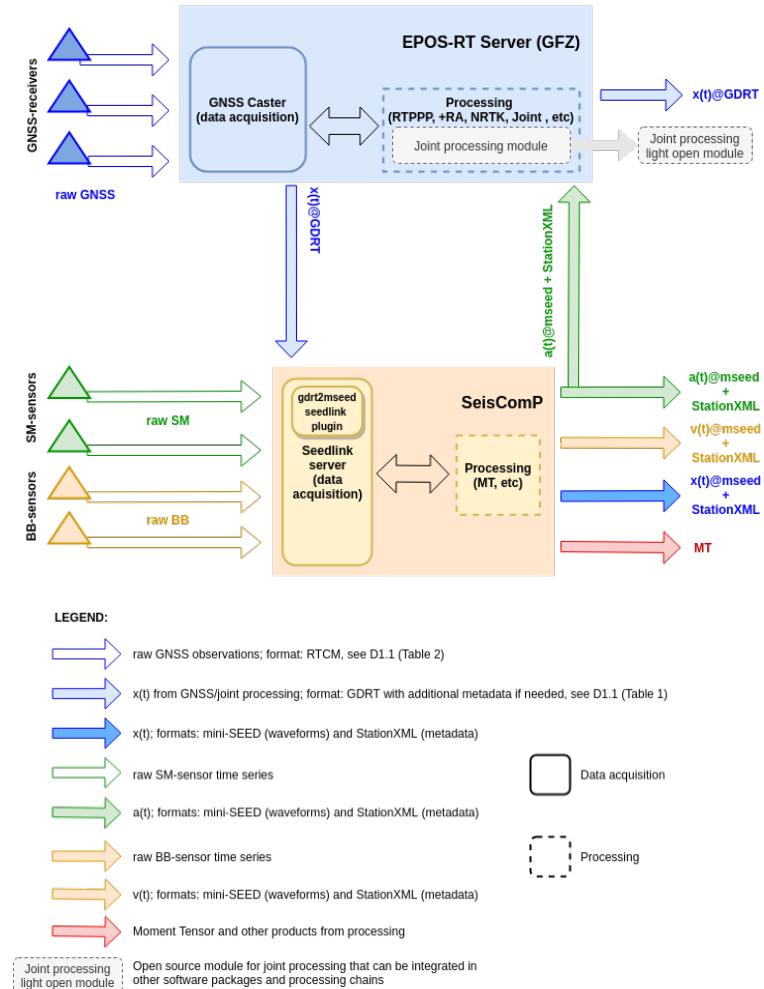
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with inputs from other colleagues of  
the EIDA/ORFEUS data centers

# 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.