Minutes for FDSN WG III
Products, Tools and Services
Cape Town, South Africa
13 January 2009

WG III Chair, Tim Ahern, called the meeting to order at 17:00 hours local time.

The minutes from the 2007 WG III meeting were approved with a minor change to include the Canadian National Data Centre as a member of the WG as both a waveform and event data centre.

The proposed draft charge for the WG was reviewed and accepted without modification. The WGIII charge is attached to these minutes.

WG III then reviewed the progress made since the last meeting of the WG. In Perugia we focused on the production of Probability Density Functions and the installation of PQLX as a distributed software application to support the production of PDFs. Since the 2007 meeting the following FDSN Data Centers have begun production of PDFs.
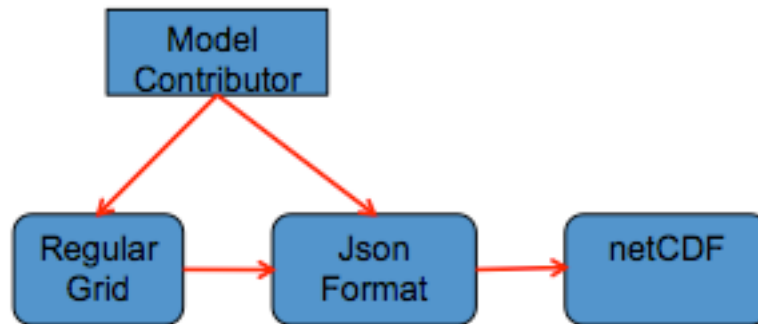- Canada National Data Centre
- ORFEUS
- IRIS
- GEOSCOPE

JAMSTEC had not yet begun this capability. Eleonore Stutzmann indicated that the FDSN should focus on a presentation standard as well as insuring that everyone is using the same algorithm. All FDSN centers should consider production of PDFs sing PQLX to insure common display and algorithm use. IRIS indicated that it plans to migrate to PQLX to do this but could not guarantee a timeframe for this. Geoscope indicated that its method is coupled to NetDC and PDFs can be produced as a result of a NetDC request. The WGIII also encouraged the development of methods whereby the underlying binary values, and not just the displays could be made available. IRIS indicated that it had developed this capability but it was not widely advertised.

WGIII then turned its attention to the development of new products.

Tomographic Model Support. The first product under consideration was the ability for researchers to submit tomographic model data to FDSN data centers in a standard format. Luca Postpichl gave a presentation that highlighted the use of the JavaScript Object Notation (JSON) format and highlighted its advantages over XML representations of similar information. He has developed a method of storing tomographic model data in JSON format that takes advantage of its compactness.

Several discussions took place at the AGU with Luca and other scientists at the meeting. ORFEUS and IRIS hope that adoption of a standard such as that proposed by Postpischl could happen. Discussions with scientists and confirmed at the WG III meeting indicated that a simpler format should also be made available. Ahern presented a strawman of such an

alternative that will be circulated to the FDSN working group for comment. The goal is to allow scientists to submit their model data in either the FDSN Simple Tomographic Model Format (STMF) or in JSON format directly.   The FDSN will develop a FDSN STMF to JSON conversion capability. Postpischl indicated that he would develop a JSON to netCDF format convertor. The capability is summarized in the figure below where the STMF is designated as the regular grid.

With tomographic models available at FDSN data centers as a first step, the FDSN can then focus on linking visualization tools to the models. netCDF format already has a series of tools that can visualize 3D models. One such tool is GEON IDV and IRIS plans to work with UNAVCO to provide a web interface that will allow selection of models, a map based definition of a transect and the production of slices through the model under the transect. In this way information can be displayed through a browser only.

There was also support for generation of KML files for visualization using Google Earth. There was also support for GMT based viewing methods.

The number one goal is to develop methods that will encourage scientists to support contribution of their tomographic models and the development of associated model repositories.

Coordinated Metadata Services
Discussions between ORFEUS and IRIS earlier this year resulted in the identification of a need to develop a system allowing clear authority for maintaining authoritative dataless SEEDS for various FDSN networks. A method of cataloging the relevant URIs on the FDSN web site was suggested and met with support.

The FDSN will also have to develop good access methods to these dataless SEED volumes. Suggested methods include a breqfast like method of sending emails to dataless@fdsn.org, the DHI interface running at several centers and the ArcLink system developed by GFZ.

Station Services
The discussion then turned toward a need for the FDSN to provide a service to provide lists of FDSN stations with logical characterizations. For instance the ability to discover
   • FDSN stations delivering data to an FDSN data center in real time

- FDSN stations whose data are present in an archive
- FDSN stations in a region or country

The concept of using Virtual Networks as developed by IRIS was suggested as one way to do this. Information could be made available seamlessly across the FDSN using web services, KML links or other easy to implement methods.

OTHER SERVICES
The WG then identified some additional products and services that might be considered. Eleonore Stutzmann of Geoscope suggested two possible future products. There were to routinely produce **receiver functions** for all FDSN stations. Ahern mentioned that a project undertaken by the University of S. Carolina called EARS resulted in receiver functions being calculated for all stations that had data in the IRIS DMC. It might be possible to extend this capability to other FDSN data centers with stations that are not archived at IRIS.

Another possible product would be the routine generation of **Synthetic Seismograms.** Ahern mentioned that the CIG project at Caltech is producing 3D synthetics for all larger events. The methodology allows synthetics to be calculated for any arbitrary point on the earth's surface. The ultimate object is to provide synthetic and observed seismic data in a seamless manner for all such events.

Ahern encouraged all members to consult the WG III web pages and to join the WG III list server to stay in touch with the working group effort. It is the responsibility of the individual to join the list.

The meeting was adjourned at 18:20.

Minutes by Tim Ahern, IRIS.

FDSN WG III Attendees
13 January 2009
Cape Town, South Africa

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FDSN Working Group III
Coordination of Products, Tools and Services

Working Group Charge

Drafted July 2007
Approved January 2009

FDSN WGIII will identify standard products that may be produced by FDSN data centers. WGIII will advocate product uniformity and methods of production for FDSN products. WG III will advocate development and distribution of standard software tools that will support the production of FDSN products. WGIII will propose methods of product discovery by a user and methods of product distribution.