Geophysical Research Abstracts
Vol. 21, EGU2019-17897-1, 2019
EGU General Assembly 2019

Improving Volcanic Data Storage and Management by means of a SQL Database

Antonio Mora, Gustavo Romero, Carmen Benítez, Manuel Titos, Sonia Mota, and Isaac Álvarez
Univeristy of Granada, Depto.TSTC

Improving Volcanic Data Storage and Management by means of a SQL Database

Antonio Mora (1), Gustavo Romero (2), Carmen Benítez (1), Manuel Titos (1), Sonia Mota (1), Isaac Álvarez (1)

(1) Departamento de Teoría de la Señal Telemática y Comunicaciones, Universidad de Granada, Spain
(2) Departamento de Arquitectura y Tecnología de Computadores, Universidad de Granada, Spain

In geophysics, and more specifically in volcanology, seismic data are collected continuously through stations equipped with sensors that sample at low frequency. As a result of this data gathering, many millions of samples are obtained in a campaign (after some months).
This could be considered as a Big Data issue due to the huge amount of different information obtained and different data storage formats. Nowadays this problem has not been addressed efficiently to date.
This work presents a proposal for an optimal storage, maintenance and access to geophysical data. Thus, in order to deal with this huge amount of information, a specialized SQL database scheme has been designed. It has been later optimized in a number of ways, such as: selecting the best data management engine, using the optimal type of search index, or tuning the different configuration parameters.
The database consist of three different 'logical' data blocks: catalogued data, collected data, and processed data. The first type refers to data about volcanic events previously identified by the corresponding geophysical entities and publicly available. The second type is formed by data gathered in different campaigns in volcanoes, considering the sensors deployed in stations, and, from them, the different physical magnitudes they can measure. The third type corresponds to the knowledge extracted from the raw data in previous types obtained through the application of manual and automatic (Data Mining/Machine Learning) techniques for the identification of volcanic events or the prediction of eruptions, for instance. The latter could be seen as a 'service' that the system would offer to end-users.
As a proof of concept, the database has been feed with a part of the data collected in a campaign at Etna volcano (six sensors in different stations during one year). Several experiments and tests have been conducted by geophysicists and computer science researchers to validate its utility.

This work has been supported by research project TEC2015-68752 (KNOWAVES, MINECO/FEDER).