From high quality seismic data acquisition in remote volcanic area to fast data distribution to scientific community: The UnderVolc project on Piton de la Fournaise volcano

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Piton de la Fournaise basaltic volcano (La Réunion island, France) is one of the most active volcano in the world with an average of one eruption every year.
This volcano is thus an ideal case study for research projects focusing on studying magmatic, seismic and deformation processes occurring in volcanic areas.

The UNDERVOLC (UNDERstanding VOLCanic Processes) research project main goal is to provide high quality 3-component broadband continuous seismic data to an amount of about 30 volcano-seismologists from different international research teams (including Japan and New-Zealand). This data acquisition system is moreover dedicated to the monitoring of Piton de la Fournaise volcano by providing real-time seismic data to the Piton de la Fournaise volcanological Observatory/IPGP.

The network consists of 21 fully autonomous stations composed of CMG40-T seismometers associated to high dynamic digitizers and linked to wireless digital radio stations.
The seismic signal is sent by UDP protocol to the observatory through a network of wireless LAN over large distances (∼10 km) and possibly through the internet to the Observatory.
The acquisition system at the observatory is composed of:
1-An Earthworm system (USGS – ISTI – CERI) with a Q330 to Earthworm data acquisition module (6 permanent stations from the observatory)
2-An Apollo server system (Nanometrics) for 15 stations (for which seismometers and digitizers belong to the French national pool of portable seismic instruments Sismob, INSU-CNRS)
In both case, requests are sent back to the stations in case of loss of udp packets.
This system allows us producing miniseed files every hour. Since September 2009, the full dataset has less then 1 % of gaps.

In order to provide a fast data access to the scientific community, we synchronize our dataset every night with the SISMOB datacenter located in France (LGIT, Grenoble). After a quality check, seed data volumes are produced and distributed by standard NETDC requests from FosFore (Fédération de l'Observation Sismologique Francaise) or directly from IRIS (Incorporated Research Institutions for Seismology).