SECOND EUROPEAN CONFERENCE ON EARTHQUAKE ENGINEERING
AND SEISMOLOGY, ISTANBUL AUG. 25-29, 2014

INTERNET - ENABLING THE HELLENIC EDUCATIONAL SEISMOLOGY NETWORK

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Greece is one of the world's most seismically active countries. This fact implies a high seismic hazard and a relevant seismic risk that must be addressed. Increasing the education of population in high seismic regions is an important step to raise the public awareness. In this regard, several actions have been taken under the framework of the Hellenic School Seismology Network.

The first one is grounded on advanced technologies by the development and installation of stand-alone seismographs and accessible tools for data analysis, in five schools located in western Greece and Peloponnese. The Educational approach was also combined by traditional communication support actions such as booklets, brochures, videos, seminars and conferences. The final results were very encouraging and the impact of the program had to spread beyond the local society. The students also expressed their interest for other environmental data such as temperature, humidity etc.

Therefore, the next step was to implement an architecture for sensor telemetry where seismographs would blend in along with other sensors required for earth or environmental observation. In order to meet these requirements, both software and hardware were re-engineered.

The new hardware supports multiple state of the art communication technologies like IEEE 802.15.4 (Low Power Wireless Sensor Connectivity standard), IEEE 802.11 (commonly known as WiFi, the standard market solution for wireless connectivity today) but also offers support for typical communication technologies like IEEE 802.3 (standard Ethernet). Additionally it supports newly adopted protocols in the network layer like 6Lowpan adaptation layer to support IPv6 over IEEE 802.15.4 networks as well as typical IPv4 connectivity enabling its use and control over the Internet, thus bringing closer to the seismological community the Internet of Things notion. Finally in the application layer the latest application protocol for low power networks is implemented and used, namely CoAP (Constraint Application Protocol) designed and maintained within the IETF, providing a standardized way for client applications to communicate with the device with minimal communication overhead.

All the data are stored locally and are being transmitted to a server whenever the network is available. The server provides a graphical interface with various information regarding the installed instruments, display of data in heliplot form, search options, data downloading etc. Extra tools such as data file viewers, especially customized for students, are available. An initial version is available under www.isi.gr/modseism. The lose coupling of the modules comprising the system, allows for the addition and hosting of application that will meet the students' requirements for extended telemetry. The modseism application already hosts a pilot energy metering application in the same platform in order to demonstrate the architectural flexibility of the design and implementation. Therefore, extending the system in order to support telemetry for environmental sensing such as temperature and humidity only requires the embedded apparatus and embedded – related software for server communication. On the server side, only the user interface is required for data visualization as the rest of the platform can support any type of telemetry data.

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Despite the short life of the system it is evident that the recording of the local seismicity seems to be a great opportunity for students, society and researchers to raise the awareness and educate to preparedness. The students are attracted by the fact that they have to deal with real time seismic events that occur next to them, interpret scientific data and draw conclusions. Therefore, near future plans include installation of educational seismographs in selected sites under the supervision of the Seismology Laboratory of University of Patras, full activation of the network and cooperation with similar European activities.

REFERENCES

This work was financially supported by GSRT Action "KRIPIS" with national and EU funds in the context of the research project "ISRTDI".