CASE STUDIES

LINUX, OPEN SOURCE & DATAHOG2

Ambertec Ltd is a company from Dorset in the United Kingdom. They are engaged in the research and development of Linux applications. The town of Verwood where they live and work, borders the New Forest and is in a valley. The valley is little more than a recess in the landscape and is certainly not of the Welsh or Scottish variety, however they believe it to have its own micro climate and that it would benefit from a weather station reporting to a website. Here are the project details in their own words:

"Open Source describes practices in production and development that promote access to the end product's source materials typically, their source code. Some consider Open Source a philosophy, others consider it a pragmatic methodology" - Wikipedia

The Linux Operating System (LOS) is normally freely available in various flavours, OPENSUSE, FEDORA, DEBIAN, UBUNTU etc and is similar, and becoming more compatible with the Microsoft Operating System. Open Source programs can be used with the LOS to perform all the normally required functions. That was not always the case when Shane and I first tried to use the Linux operating system in about 2003. We experimented with numerous versions of Linux but the flakiness of the programs in those days, combined with our limited knowledge of Unix conspired to severely limit functionality, however we persevered.

Along with the LOS there was a raft of other Open Source programs being developed for Linux by people or organizations who were not necessarily after 'big bucks' but were making freely available the products of their skill and ingenuity for use, development and expansion by others. This concept we felt was worth supporting and we made the conscious decision that we would use wherever possible Open Source material, which normally carried a GNU licence. By 2007, Linux, Open Source and our knowledge of it, had developed sufficiently to take on a relatively difficult project. The project turned out to be the weather station. We decided to explore our microclimate by recording the weather and reporting our findings to a website automatically. The site was and is www.verwoodweather.co.uk.
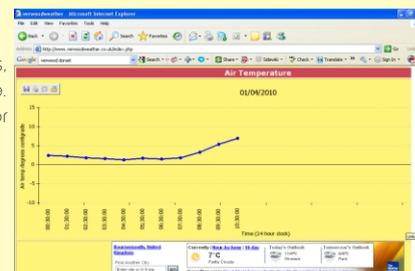
We purchased the following equipment from Skye Instruments: DataHog2 provided 9 outputs, MainsHog provides power and communications, rht+ Humidity & Temperature probe provides air temperature and humidity readings, Pyranometer sensor for light readings, Air pressure sensor, 4 Temperature probes provide soil and water readings, Cables of various lengths. (Wind Sensors to be added later on)

Erection of the instruments was relatively straight forward and the DataHog2 was connected to a PC running on SUSE Linux. We explained to Skye that we were endeavouring to use their equipment in conjunction with the LOS and other software and we were referred to a program called Minicom, a text-based modem control and terminal emulation program for Unix-like operating systems. Using that program and making reference to Skye Lynx Auto supplied by Skye for MS systems we were able to extract the data from the Hog in a text format which included the date and time of the readings. The text was then imported using PHP to a web server's MYSQL database and extracted from the database using HTML, PHP and JAVA programs.

The website itself was created using KDE, GIMP and other programs. We also made extensive reference to the Internet and to relevant books, periodicals manuals etc. The data is extracted from the DataHog every hour. It stores considerably more data but ultimately overwrites. Around June 2009 we suffered a loss of data through overwrite when a passing rodent chewed our DataHog cable. The break remained unnoticed for some time, as our error reporting was not as robust as it is now. If we experience any problems now the server sends us an email.

All data collected can be found on the website and is freely available to individuals and institutions provided that the source is acknowledged and commercial use is subject to our agreement. We are sure that there are more elegant solutions to our project using Linux and Open Source but ours is reasonably fast and has been reliable so far. Is our microclimate distinct from the rest of the area? We have a good start for comparison because apart from the data lost in our rodent incident we will have a full year's data by the end of March 2010.

Please contact shane.fail@ambertec.net if you have any comments, observations or if you would like to take on a similar challenge. www.verwoodweather.co.uk Thanks to Shane Fail and Noel Bonczoszek for this interesting article.