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Tools: 'Vista Data Vision' Data Analysis Software Review
- Jason Downing (BNZ)

Like many research programs, our LTER site is continually struggling to manage numerous remote sensor stations and their data. We are constantly looking to improve the quality and availability of the data they are collecting while using technician time and resources effectively. One option on the market to manage sensor network data is Vista Data Vision (VDV) and after some initial testing, we decided to take the plunge and have not yet been disappointed.

You must be thinking, "What can this program do for me?". The answer is everything; well just about. It comes prepackaged with everything you need to take data from a field datalogger, pass it through some standard QA/QC filters, deposit it in a MySQL database, and make it fully viewable and downloadable on the internet. And all of this can be done without any custom coding or database configuration; in fact you could practically do it without ever having created a web page or even knowing anything about MySQL.

The system architecture is designed to function through three main application components. The first, db.robot.c, monitors the data files in your library and copies new data into the MySQL database. While the specific design and configuration of this database could be completely ignored, more advanced users can use any number of MySQL GUI tools to interact with this instance as they would any other; allowing even more options to extract and manipulate the contents. The second application, db.data.browser, is a configurable data browser that allows users to configure setup options and display data from a variety of stations and sensors in graphical format. With this the user can create pages with up to six graphs, each having up to six variables, that can then be browsed through time or edited if need be. This component also functions to create reports for entry back into the db.robot.c or produce advanced calculations, such as wind roses or

wind energy calculations. Lastly, there is db.web.browser which allows the web user to do much of the db.data.browser operations (excluding setup and graphical edits) and includes everything needed to initiate and deploy an accessible web service. This allows users outside the local network to access data and download the data as text files for use with other applications to analyze or archive.

The Vista Data Vision program monitors your .DAT data files, collected with CS's Loggernet or Canary System's Multilogger; and as they are updated with new data, it is imported into a MySQL database (installed and configured by VDV) where it is immediately available to view or download on the web. Historical data files as well can be simply imported and there are file converters available if your data is in .CSV files.

There are also numerous access control options so you can have a host of users that would each have customized access to specific stations or sensors. The controls can also moderate which features are available to each user so you can control who can edit, download, or simply view the data.

Additional features that are available include an alarm monitoring function to send messages via email or text message when stations or sensors are either reporting data outside of acceptable limits or if the stations are failing to report altogether. There is also a toolkit to produce automatic reports in Word or text format on variable time scales (daily, weekly, monthly, quarterly, annually or simply on demand) and then email these to desired contacts. There is also a notation feature so a maintenance logs can be easily maintained along side the actual data. The validation toolkit provides the functionality for automatic removal of out of range data as well as unexpected noise or data spikes. Users can also create virtual variables, which are calculated values based on mathematical functions using data from the datalogger, to produce rescaled values or calculated results that were not performed by the datalogger. And lastly, in has a module to easily include web camera images along side the data so these images are available on the web and connected to the data if that is what you desire.

The cost for this program ranges, based on the chosen version, from $995 to $4,995 (Version Comparison: http://www.vistadatavision.com/index.php?page=version-comparison). This is a significant investment for sites operating with increasingly tight budgets but our analysis determined that for our needs, even the full featured PRO version with the highest price tag would be worth the investment when we factored in the ease of installation, quality of support, and time saved developing these tools ourselves. The PRO version will allow us to quickly implement systematic data quality

procedures, easily get our current streaming data available and viewable through a web interface, give us room to grow over time as we add stations, and make this service available to some of our affiliated research groups that are also running telemetry stations located in our research areas. We initially deployed the free 30-day Trial Version that is offered on their website and initiated a dialog with an application specialist at Vista Engineering. Even though they are based in Iceland and multiple time zones from Alaska they were quick and helpful in addressing our questions. They were also extremely helpful in helping us to customize and troubleshoot the installation for our site and actually included a few code changes and improvements to the program specific to our requests. These customizations will eventually be included as standard features in future releases of the product, hopefully making the program even stronger for other users as well.

Unfortunately for some, this program is only available to run on Windows operating systems (Server2000/2003, XP Home/Pro, Vista, and 2000/ 2000 Pro). However, this program has been designed especially with Campbell Scientific (CS) dataloggers in mind; which also requires a Windows environment in some way to operate the remote telemetry connection software. Therefore, it is simple to have just one computer that runs all of the CS and VDV software concurrently. There are ways to host the web components through a Linux/Apache server running PHP if you desire but we opted to stick with the Windows IIS option for simplicity and ease of installation. With that, we were able to imbed the VDV pages within our existing web template so the newly generated data pages have the same look and feel of our existing web infrastructure.

The VDV (http://www.vistadatavision.com/) website is full of useful product information, educational materials, case studies and user testimony. The CS (http://www.campbellsci.com/) website also has additional information about the product and its interaction with other Campbell software. They also provide some additional user profiles and reviews.

The end result is a powerful and user friendly 'out of the box' solution to effectively mange almost any sensor network. The initial cost may be on the steep side but the simplicity to use and quickness to get the system deployed has saved enormous amounts of development time and technician training. Feel free to check out the Bonanza Creek site (http://www.lter.uaf.edu/bnz_vdv.cfm) to see what we have done or contact me (jpdowning@alaska.edu) for additional information.