Security Data Warehouse Application

Lyndon B. Johnson Space Center, Houston, Texas

The Security Data Warehouse (SDW) is used to aggregate and correlate all JSC IT security data. This includes IT asset inventory such as operating systems and patch levels, users, user logins, remote access dial-in and VPN, and vulnerability tracking and reporting. The correlation of this data allows for an integrated understanding of current security issues and systems by providing this data in a format that associates it to an individual host. The cornerstone of the SDW is its unique host-mapping algorithm that has undergone extensive field tests, and provides a high degree of accuracy.

The algorithm comprises two parts. The first part employs fuzzy logic to derive a best-guess host assignment using incomplete sensor data. The second part is logic to identify and correct errors in the database, based on subsequent, more complete data. Host records are automatically split or merged, as appropriate.

The process had to be refined and thoroughly tested before the SDW deployment was feasible. Complexity was increased by adding the dimension of time. The SDW correlates all data with its relationship to time. This lends support to forensic investigations, audits, and overall situational awareness.

Another important feature of the SDW architecture is that all of the underlying complexities of the data model and host-mapping algorithm are encapsulated in an easy-to-use and understandable Perl language Application Programming Interface (API). This allows the SDW to be quickly augmented with additional sensors using minimal coding and testing. It also supports rapid generation of ad hoc reports and integration with other information systems.

This work was done by Lynn R. Vernon, Robert Hennan, Chris Ortiz, and Steve Gonzalez of Johnson Space Center, and John Roane of MEI Technologies. For further information, contact the JSC Innovation Partnerships Office at (281) 483-3809.

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

MEI Technologies
2525 Bay Area Blvd., Suite 300
Houston, TX 77058
Phone No.: (281) 283-6200
E-mail: meiinfo@meitechnic.com

Refer to MSC-24148-1, volume and number of this NASA Tech Briefs *issue, and the page number.*

Integrated Laser Characterization, Data Acquisition, and Command and Control Test System

Goddard Space Flight Center, Greenbelt, Maryland

Satellite-based laser technology has been developed for topographical measurements of the Earth and of other planets. Lasers for such missions must be highly efficient and stable over long periods in the temperature variations of orbit. In this innovation, LabVIEW is used on an Apple Macintosh to acquire and analyze images of the laser beam as it exits the laser cavity to evaluate the laser's performance over time, and to monitor and control the environmental conditions under which the laser is tested. One computer attached to multiple cameras and instruments running LabVIEW-based software replaces a conglomeration of computers and software packages, saving hours in maintenance and data analysis, and making very long-term tests possible.

This all-in-one system was written primarily using LabVIEW for Mac OS X, which allows the combining of data from multiple RS-232, USB, and Ethernet instruments for comprehensive laser analysis and control. The system acquires data from CCDs (charge coupled devices), power meters, thermistors, and oscilloscopes over a controllable period of time. This data is saved to an html file that can be accessed later from a variety of data analysis programs. Also, through the LabVIEW interface, engineers can easily control laser input parameters such as current, pulse width, chiller temperature, and repetition rates. All of these parameters can be adapted and cycled over a period of time.

This work was done by Paul Stysley and Barry Coyle of Goddard Space Flight Center, and Eric Lyness of Mink Hollow Systems, Inc. Further information is contained in a TSP (see page 1). GSC-16298-1