"convergence layer" of adapters that encapsulate bundles in the protocol data units (PDUs) of the underlying networks' native protocols for transmission and also extract bundles from the PDUs of those protocols as they are received. This convergence-layer encapsulation enables an application in one network to communicate with an application in another network built on entirely different native protocols, both of which are spanned by the DTN.

Security will be important for the bundle protocol. The stressed environment of the underlying networks over which the bundle protocol will operate makes it important that the DTN be protected from unauthorized use, and this stressed environment poses unique challenges on the mechanisms needed to secure the bundle protocol. Furthermore, DTNs may very likely be deployed in environments where a portion of the network might become compromised, posing the usual security challenges related to confidentiality, integrity, and availability.

The BSP encompasses four mechanisms that are designed to provide this security. The technology currently being reported implements one of those mechanisms, the Bundle Authentication Block (BAB), and provides a framework for implementation of the remaining mechanisms: Payload Integrity Block, Payload Confidentiality Block, and Extension Security Block.

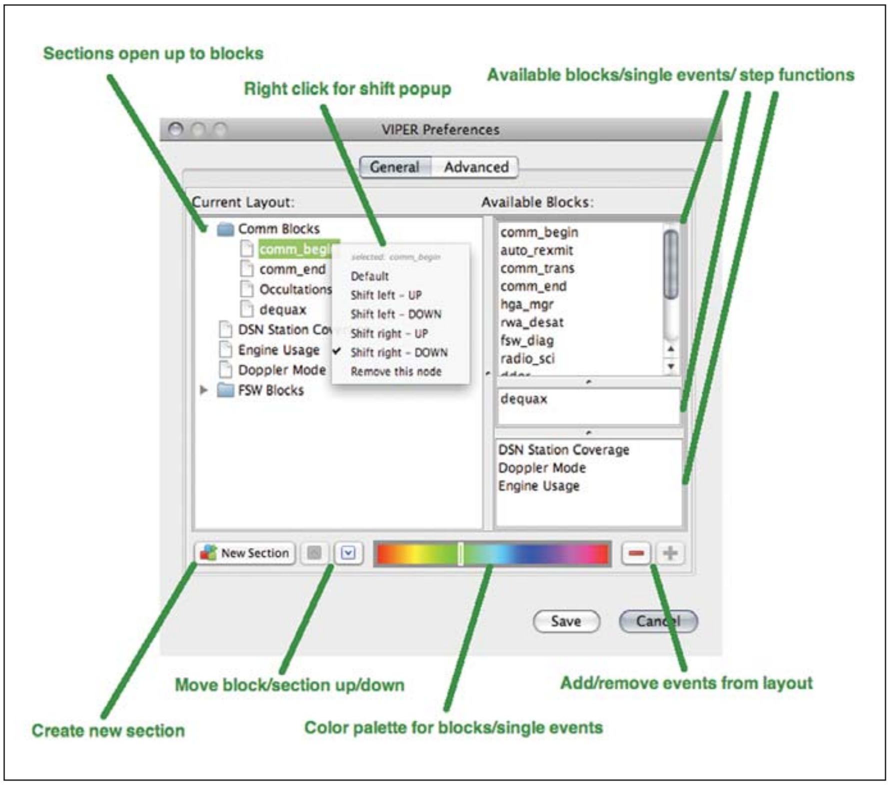
The ION system runs on Linux, OS/X, Solaris, FreeBSD, RTEMS, and VxWorks, and it should port readily to other POSIX-based operating systems. No special hardware is required. RAM (random access memory) requirements depend on the volume of DTN traffic that must be handled.

This work was done by Scott C. Burleigh of Caltech and Edward J. Birrane and Christopher Krupiarz of the Johns Hopkins University Applied Physics Laboratory for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47211.

Visual PEF Reader — VIPER

NASA's Jet Propulsion Laboratory, Pasadena, California



VIPER GUI general preferences.

This software graphically displays all pertinent information from a Predicted Events File (PEF) using the Java Swing framework, which allows for multi-platform support. The PEF is hard to weed through when looking for specific information and it is a desire for the MRO (Mars Reconnaissance Orbiter) Mission Planning & Sequencing Team (MPST) to have a different way to visualize the data. This tool will provide the team with a visual way of reviewing and error-checking the sequence product.

The front end of the tool contains much of the aesthetically appealing material for viewing. The time stamp is displayed in the top left corner, and highlighted details are displayed in the bottom left corner. The time bar stretches along the top of the window, and the rest of the space is allotted for blocks and step functions. A preferences window is used to control the layout of the sections along with the ability to choose color and size of the blocks.

Double-clicking on a block will show information contained within the block. Zooming into a certain level will graphically display that information as an overlay on the block itself. Other functions include using hotkeys to navigate, an option to jump to a specific time, enabling a vertical line, and double-clicking to zoom in/out.

The back end involves a configuration file that allows a more experienced user to pre-define the structure of a block, a single event, or a step function. The individual will have to determine what information is important within each block and what actually defines the beginning and end of a block. This gives the user much more flexibility in terms of what the tool is searching for. In addition to the configurability, all the settings in the preferences window are saved in the configuration file as well.

This work was done by Victor Luo, Teerapat Khanampornpan, Rudy A. Boehmer, and Rachel Y. Kim of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47509.