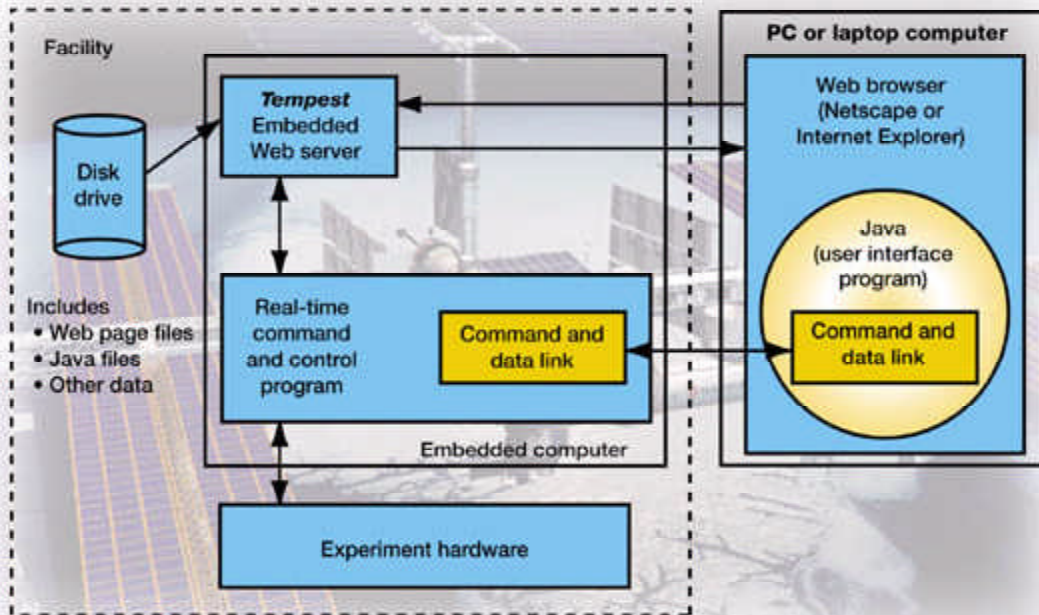


New Web Server—the Java Version of *Tempest*—Produced

A new software design and development effort has produced a Java (Sun Microsystems, Inc.) version of the award-winning *Tempest* software (refs. 1 and 2). In 1999, the Embedded Web Technology (EWT) team received a prestigious R&D 100 Award for *Tempest*, Java Version. In this article, "*Tempest*" will refer to the Java version of *Tempest*, a World Wide Web server for desktop or embedded systems.

Tempest was designed at the NASA Glenn Research Center at Lewis Field to run on any platform for which a Java Virtual Machine (JVM, Sun Microsystems, Inc.) exists. The JVM acts as a translator between the native code of the platform and the byte code of *Tempest*, which is compiled in Java. These byte code files are Java executables with a ".class" extension. Multiple byte code files can be zipped together as a "*.jar" file for more efficient transmission over the Internet. Today's popular browsers, such as Netscape (Netscape Communications Corporation) and Internet Explorer (Microsoft Corporation) have built-in Virtual Machines to display Java applets.



Embedded Web Technology.

The popularity of Java has given Sun Microsystems, Inc., the ability to support a large number of platforms and operating systems. *Tempest* was able to leverage this popularity and make it attractive for a wide range of users to employ *Tempest* as a platform-independent web server.

Tempest was designed with features allowing ease of installation in embedded or desktop computers. Separate configuration files are one of these features. The user can modify the configuration files to limit client access to the server according to Internet Protocol (IP) addresses or to specific user ID and password combinations that force clients to identify themselves as valid users. Other configuration files include a file that links stored images to specific user ID's for the customization of web pages served by *Tempest* and a file that contains pseudo commands for other executables on the server. The pseudo commands work in conjunction with *Tempest*'s dynamic web page feature or custom <TEMPEST> tags to modify the contents of web pages as they are served.

Command line options allow users to specify *Tempest* port numbers and persistent or nonpersistent connections, and to enable or disable a debug feature, a logging feature, or the client ID and password authorization.

Tempest requires little minimum memory (<200 kilobytes) and computer resources. Its source code is available through participation in the EWT Workshops and is well documented for those who wish to customize the code. A user manual and design manual are also available.

Existing applications of *Tempest* include remote control of video cameras (pan, tilt, zoom, and focus), science experiments for education (ref. 2), and applications in the automotive, medical, instrumentation, machine control, and communications industries. *Tempest* is being applied in-house in Glenn's Satellites and Networking Branch, Manufacturing Engineering Division, and External Programs Directorate.

Find out more about Glenn's EWT <http://vic.grc.nasa.gov/>.

References

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Special Recognition: *Tempest*, Java Version, received a 1999 R&D 100 Award.