Mission Challenges For Information

Plant Telemetry/Telecommand, Space Communications Protocol Specification (SCPS), and the CCSDS File Delivery Protocol (CFDP).

So, with the addition of DTN protocol libraries interplanetary network, engineers at JPL can characterize future space network performance trade-offs.

This work was done by John S. Seguí, Esther H. Jennings, and Jay L. Gao of Caltech for NASA’s Jet Propulsion Laboratory. For more information, contact jsegui@caltech.edu. Refer to NPO-43410.

Parallel Eclipse Project Checkout

Parallel Eclipse Project Checkout (PEPC) is a program written to leverage parallelism and to automate the checkout process of plug-ins created in Eclipse RCP (Rich Client Platform). Eclipse plug-ins can be aggregated in a “feature project.” This innovation digests a feature description (xml file) and automatically checks out all of the plug-ins listed in the feature. This resolves the issue of manually checking out each plug-in required to work on the project. To minimize the amount of time necessary to checkout the plug-ins, this program makes the plug-in checkouts parallel. After parsing the feature, a request to checkout for each plug-in in the feature has been inserted. These requests are handled by a thread pool with a configurable number of threads. By checking out the plug-ins in parallel, the checkout process is streamlined before getting started on the project.

For instance, projects that took 30 minutes to checkout now take less than 5 minutes. The effect is especially clear on a Mac, which has a network monitor displaying the bandwidth use. When running the client from a developer’s home, the checkout process now saturates the bandwidth in order to get all the plug-ins checked out as fast as possible. For comparison, a checkout process that ranged from 8-200 Kbps from a developer’s home is now able to saturate a pipe of 1.3 Mbps, resulting in significantly faster checkouts.

Eclipse IDE (integrated development environment) tries to build a project as soon as it is downloaded. As part of another optimization, this innovation programatically tells Eclipse to stop building while checkouts are happening, which dramatically reduces lock contention and enables plug-ins to continue downloading until all of them finish. Furthermore, the software re-enables...
automatic building, and forces Eclipse to do a clean build once it finishes checking out all of the plug-ins.

This software is fully generic and does not contain any NASA-specific code. It can be applied to any Eclipse-based repository with a similar structure. It also can apply build parameters and preferences automatically at the end of the checkout.

This work was done by Thomas M. Crockett, Joseph C. Joswig, Khawaja S. Shams and Mark W. Powell of Caltech and Andrew G. Bachmann of Stinger Ghaffarian Technologies Inc for NASA’s Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47136.