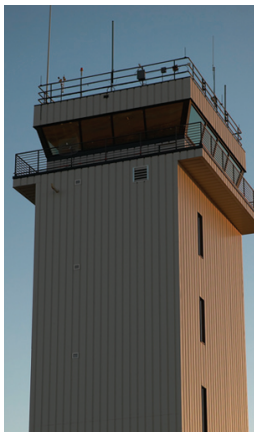
technology ■ opportunity

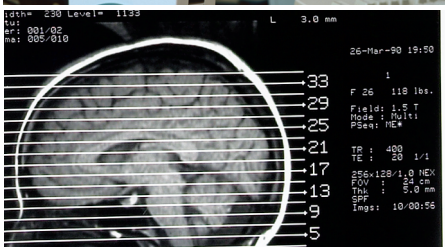
National Aeronautics and Space Administration
www.nasa.gov

computer software

Standard Autonomous File Server

... enhanced speed and reliability for automated data file transfers





NASA Goddard Space Flight Center invites companies to license its Standard Autonomous File Server (SAFS) software for faster and more reliable automated management and distribution of large data files. The SAFS technology enables prioritized delivery of data, allowing multiple clients to automatically receive or request data from the file server as needed. The system uses commercial off-the-shelf (COTS) software and hardware and eliminates the need for expensive dedicated telemetry equipment and network connections. It operates as a stand-alone solution, monitoring itself, and incorporating an automated fail-over process to enhance reliability.

Benefits

- **Reliable**: SAFS provides automated fail-over processing to ensure quicker and more reliable file transfers than previously possible.
- **Fast**: Because interactions with the firewall and security protocols are reduced, data is delivered in near real time making optimal use of bandwidth.
- **Unattended operation**: This automated system includes self-correction capabilities to enable operation with no human interaction.
- **Scalable**: Centralized data storage is easily scalable by adding more storage capacity.
- **Universal**: The SAFS code is generic and easily adaptable to most hardware and operations requirements.
- **Reduces costs**: Automated Web reporting eliminates the need for expensive dedicated telemetry equipment and network connections. Additional cost savings are found in unattended operation and the use of COTS hardware and software.

Applications

- File server systems and operating systems
- Digital movie data distribution (i.e., delivery method by streaming data over broadband networks from centralized servers)
- Commercial satellite downlink distribution
- Financial market distribution
- Traffic management centers
- Air traffic control centers
- Medical information distribution

The Technology

The patented Standard Autonomous File Server performs automated management of large data files and provides quick access by separating data acquisition activities from file distribution activities.

How it works

SAFS servers are located on both open and closed networks. Closed network servers acquire data and remain isolated from clients. Data is transferred to a second SAFS server located on an open network, eliminating special firewall and security rules to speed up transmission.

Clients either "pull" files or receive "pushed" files from the SAFS system. When a file transfer is successful, a receipt confirmation notification (RCN) is returned. The SAFS fail-over file transfer process enables the client to specify multiple backup receiving locations. The primary receiving location is attempted first and, if unsuccessful after a specified number of tries, the system self-corrects and sequentially tries backup locations until successful or there are no more backup locations. [Insert slide #1 = File Transfer Scheme from ppt file that only has two slides] If a file transfer is ultimately unsuccessful, a failure notification e-mail directs the client to pull the file from the sender's location during a specified retention period.

The SAFS system uses four levels of file prioritization. Before file transmission, priority is compared against other file transfers in progress. If the new file's priority is higher, the lower priority transfer is stopped, and the higher priority file is transferred. Once complete, the previously stopped transfer is resumed from the point at which it had been stopped. Equal priority files are either queued or transferred together.

SAFS performance reporting eliminates the need for expensive dedicated telemetry equipment and network connections. RCN data is used in performance monitoring and latency reports sent to a Web server and enabling clients, project managers, and system administrators to remotely verify file availability and system performance.

Why it is better

Because SAFS servers for data distribution to clients are located outside of closed networks, transmissions are faster and bandwidth is reduced. SAFS automation reduces costs by reducing personnel costs.

Since its initial development, SAFS has been in use in six locations supporting eight satellite projects with high success rates. SAFS offers flexible, reliable, and timely data distribution at lower costs.

Licensing and Partnering Opportunities

This technology is part of NASA's Innovative Partnerships Program, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to consider licensing the Standard Autonomous File Server (GSC-14409-1) technology for commercial applications.

For More Information

If you are interested in more information or want to pursue transfer of this technology (GSC-14409-1), please contact:

Office of Technology Transfer
NASA Goddard Space Flight Center
SAFS@gsfc.nasa.gov

More information about working with NASA Goddard's Office of Technology Transfer is available online:
http://techtransfer.gsfc.nasa.gov

GSC-14409-1
12.19.05