National Aeronautics and Space Administration

technology solution

Information Technology and Software

Autonomic and Apoptotic Highly Distributed System

Adapts autonomic and apoptotic functions developed for space to cloud, grid, and other distributed systems.

NASA Goddard Space Flight Center has developed software that mimics the biological mechanisms of autonomic systems and apoptotic systems (the process that shuts down cells when they no longer serve a purpose). The software developed by NASA Goddard provides self-management and security for a distributed system such as a satellite swarm in which craft communicate and collaborate.

Originally developed for space missions, this capability has now been extended for use in terrestrial applications involving cloud and grid-based systems, and other applications requiring highly distributed operation.

BENEFITS

- Greater autonomy of distributed computer systems
- Quicker and more robust automatic response to security threats

THE TECHNOLOGY

Next-generation computer-based systems that perform highly distributed systems upon systems operation require that the environment is self-managing. This NASA Goddard technology provides a range of features that include a variety of autonomic computing (self-managing) techniques. These include an apoptotic (self-destruct) mechanism for SWARM agents and spacecraft and autonomous and autonomic environments.

With the future direction of computer-based systems becoming highly distributed (such as cloud and grid computing), autonomic capabilities will be increasingly critical for creating and maintaining a pervasive self-managing system.

APPLICATIONS

The technology has several potential applications:

- Self-managed distributed computer systems
- Computer security
- Space exploration
- Commercial satellite systems involving multiple craft working in concert

PUBLICATIONS

Patent No: 8983882

More Information

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NP-2015-04-1720-HQ

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GSC-16461-1
GSC-TOPS-128