



National Aeronautics and
Space Administration



TECHNOLOGY SOLUTION

Information Technology and Software

Integrated Genomic and Proteomic Information Security Protocol

A biologically inspired security protocol that offers three levels of encryption and authentication

The evolving nature of the internet will require continual advances in authentication and confidentiality protocols. Nature provides some clues as to how this can be accomplished in a distributed manner through molecular biology. Cryptography and molecular biology share certain aspects and operations that allow for a set of unified principles to be applied to problems in either venue.

BENEFITS

- Highly Secure: This new security protocol offers three levels of encryption and authentication, and is highly secure due to the vast range of variability and randomness when using the genomic code for key generation
- Adaptable: The protocol offers a modular design, such that it can be tailored on a customer-specific basis and can function with or without the in vitro biochemical features



THE TECHNOLOGY

NASA GSFC has developed a cybersecurity security protocol consisting of message exchanges utilizing message authentication codes and encryption codes derived from the genetic encoding system for key generation, Proteins and the processes of transcription and translation of DNA and RNA into proteins. These are used in conjunction with the existing principles of a public key infrastructure and traditional encryption and authentication algorithms and processes. This security protocol requires a cryptanalysis infrastructure not available to most attackers. By using the processes of transcription and translation of actual genes (referred to as biogenes) in conjunction with a genomic and proteomic based encryption and authentication approach, security is achieved in two simultaneous domains. An attacker has to successfully breach both domains simultaneously for successful network attack.

APPLICATIONS

The technology has several potential applications:

- Biologically inspired technology in devices that resemble RSA-style tokens
- Biologically based information security

PUBLICATIONS

Patent No: 8898479

More Information

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