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Janus

Janus was the god of gates, doors, doorways, beginnings, and endings.
(*from Wikipedia*)

- C++ interface class for DAVE-ML datasets
- Enables DAVE-ML as native format – not just exchange
- Abstracts data from model code – component to total effect
- Common API for dissimilar data structures
- Centralises data handling functions
- Implements Gridded Data, Ungridded Data and MathML

Janus

- Validates dataset against DTD, then parses & loads into a Document Object Model (using Apache *Xerces* parser)
- Build numerical structures in memory for variables / tables
- Manages inputs, outputs and internal variables
- Performs specified interpolation / extrapolation
  - Discrete, Linear, Quadratic, Cubic
  - Add Spline and other basis functions in the future.

Janus

- Encryption/decryption capability using AES-256bit symmetric keys and RSA algorithm.
  - Impacts on instantiation but NO runtime penalty.
  - Used to ensure data integrity.
- Performance for >> real-time applications.

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Janus - Since 2005

- Learning about DAVE-ML/Janus idiosyncrasies through dataset development.
- Increased robustness of data handling functions.
- Extended Math-ML support.
- Identified areas of deficiencies, including speed improvements.
- Developed a Matlab module to read and write DAVE-ML files.

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Janus Web Site

- Janus will be released as an open source application, covered by the DSTO Open Source Licence.

- A copy of Janus can be requested from:
  - Janus@dsto.defence.gov.au
  - http://www.dsto.defence.gov.au/ *(once finalised)*

Further Work

- Maturity of DTD
  - Data uncertainty component.
    - Best approach for using this?
  - Data type definitions – Vectors, Matrices.
  - MathML definition.
    - Problems with validating XML files, appears to be associated with namespace definition.
  - Modification Record – Date attribute.
  - Test cases.

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Carna

Carna was a nymph who lived where Rome would eventually be.
Janus fell in love with her and gave her power over door hinges and handles.
(*from Wikipedia*)

- C++ interface class for Store-ML datasets
- Store-ML is an extension of DAVE-ML for encapsulating store/cargo/instrumentation data.
  - Aerodynamic, mass and location properties.
- Define allowable configurations for aircraft and flight condition limits.