Collaborative Assistive Tool To Enable Novel Solutions (CATTENS) DE Expansion

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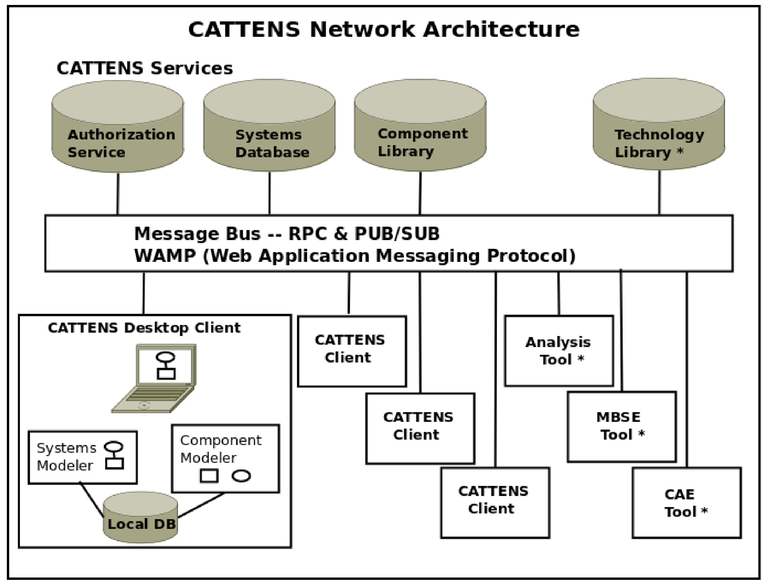
CATTENS is a model-based, multi-disciplinary concurrent engineering tool …

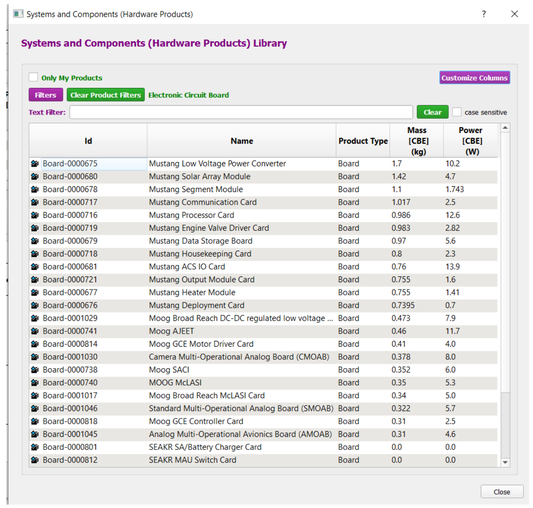
… whose purpose is to enable engineers and scientists to collaborate in defining and developing a mission or system concept. CATTENS has just completed its second year of development as an IRAD project and is currently scheduled for deployment in February 2018. The initial deployment target for CATTENS is the GSFC Mission Design Laboratory (MDL), but CATTENS will be made available to all GSFC engineers and scientists.

CATTENS Digital Engineering (DE) Features

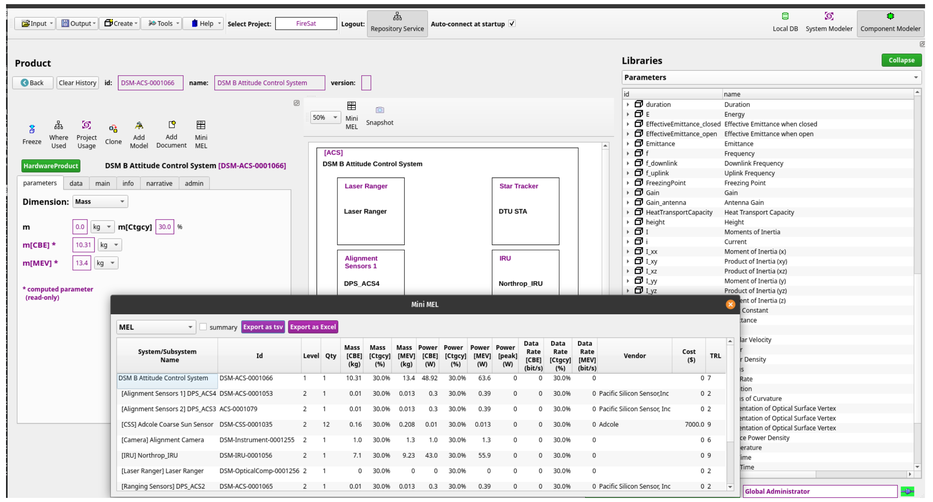
- System Modeler with expansion & navigation of a full system / subsystem assembly tree
- Component Library with reusable library items, sortable by parameters, filterable by product types
- Component / Assembly Modeler with drag and drop of Components into the Block Diagram (SysML IBD), drag and drop addition of Ports, and drag and drop connection of Ports (Flows)
- Generates a Master Equipment List (MEL) from a System assembly tree in GSFC standard Excel format
- Tools:
  - CAD Viewer imports a 3D MCAD model from any STEP (ISO 10303) file
  - Optical Error Budget Tool extracts structure and sensitivities from a Linear Optical Model (LOM)
  - 42 Input Tool creates formatted input files for the 42 Attitude Control System Simulator



Component Library



Component / Assembly Modeler



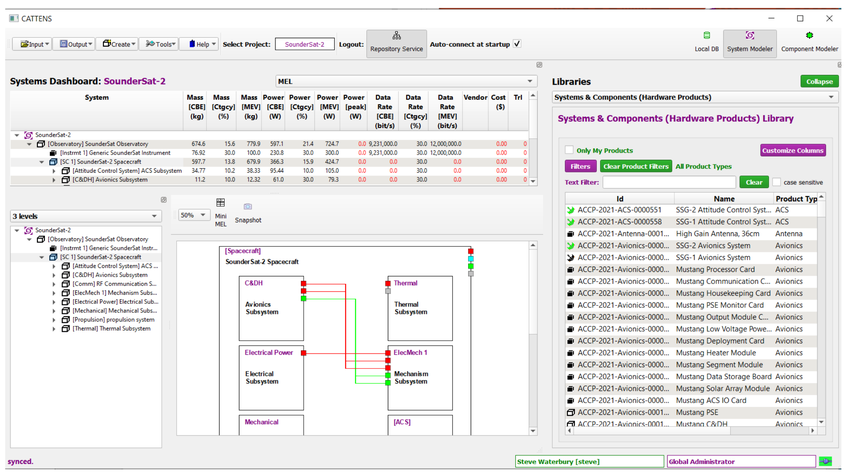
CATTENS Architecture

CATTENS consists of 3 components:

1. A Desktop Client that can operate in either stand-alone or networked mode.
2. A Repository Service that holds the Systems Database and Component Library.
3. A Message Bus ("Crossbar") that enables Remote Procedure Calls (RPCs) and near-real-time Publish/Subscribe (Pub/Sub) messaging between the Desktop Client and services (Crossbar also supports peer-to-peer communication among clients; that has not yet been used in CATTENS but may be in the future).

CATTENS utilizes an Authorization Service, "Omnipotent Management Backend" or OMB, which has been developed by Michael Plante of Code 585 under the CATTENS IRAD.

System Modeler



Tools: Optical Error Budget Tool, CAD Viewer