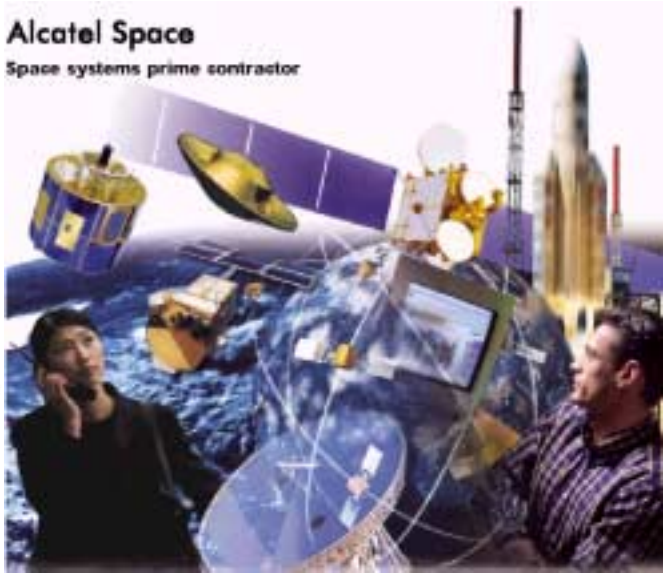
ALCATEL SPACE

- Alcatel Space is a leader in all civil and military applications, telecommunications, navigation, optical and radar observation, meteorology, sciences, space robotics, launch operations and ground control. Alcatel Space clearly possesses the expertise that makes the Company a world-class space systems prime contractor.



- Alcatel Space, through its subsidiary Alcatel Space Industries, can supply a range of products, from stand-alone equipment to end-to-end, turnkey systems. The Company assumes responsibility for overall system design, manufacturing and operation, as well as orbital slot acquisition and financial engineering.

esa DATAMAT

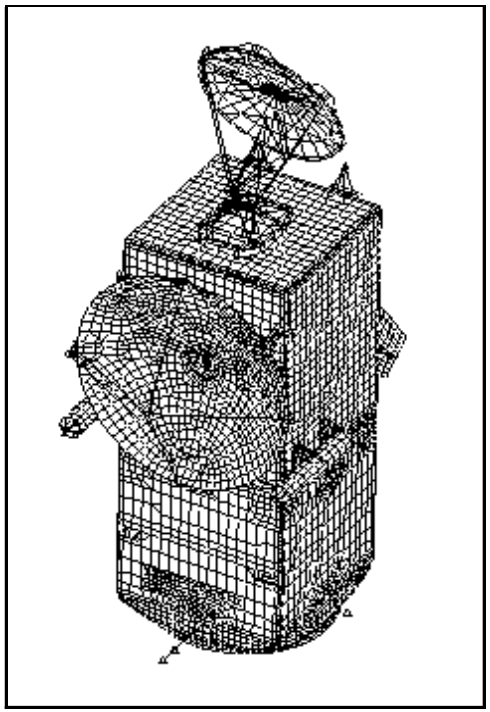
Mechanical Engineering
Why GRID?

- Analyses in Mechanical Engineering
  - Wide range of disciplines involved in mechanics (Acoustics, Materials, Shock, Kinematics,…)
  - Connections with numerous other physical domains (Thermal Control, Antennae, Optics, Mechanisms…) driven by several separate engineers teams
  - Many software required to perform mechanical analysis on satellite platforms ➔ computational resources and management of a large amount of data

Mechanical Engineering
Why GRID?

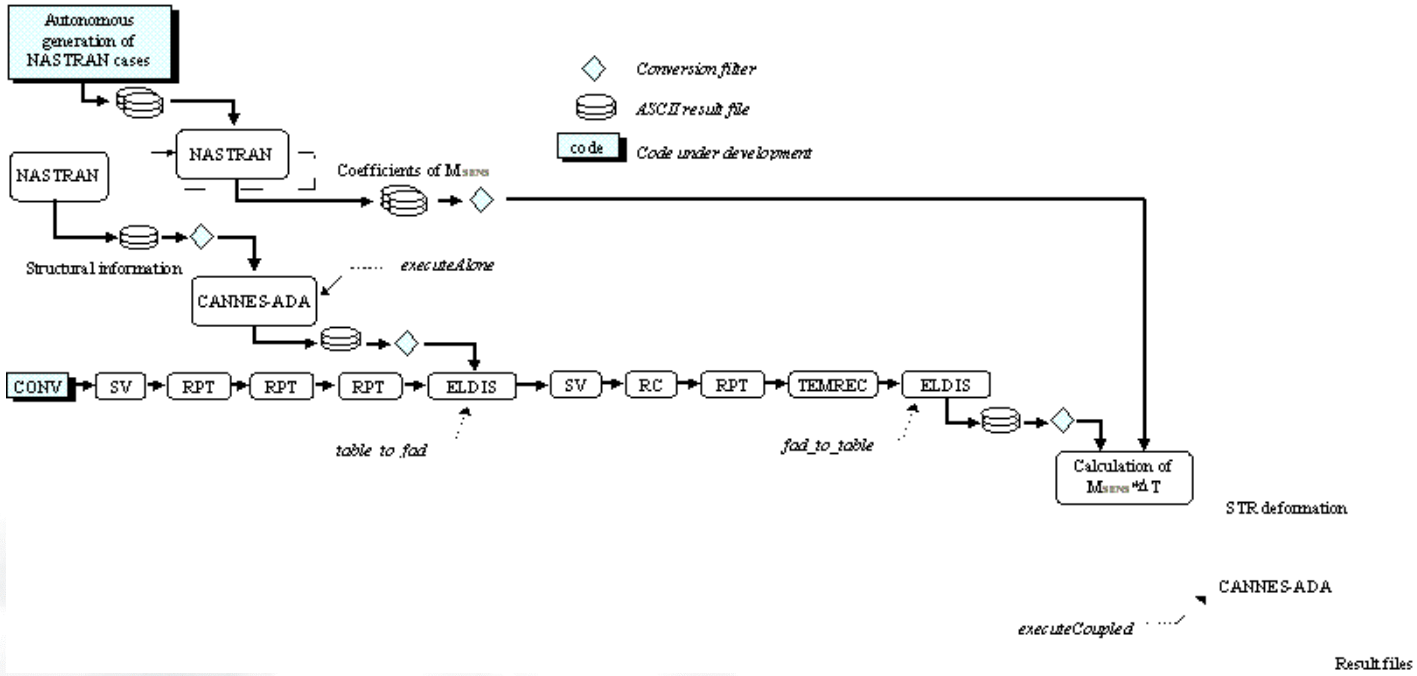
- GRID environment ➔infrastructure for fast calculations and data storage
  - Exploiting available resources in a distributed way to compute each physical behaviour
  - Collecting all results
  - Optimising the global mechanical solution

- Example of collaborative application created by Alcatel in Jaco^3 project
  - Coupling existing codes and data visualisation systems in mechanics, thermal control and AOCS analyses
  - ➔ thermo-elastic behaviour of satellites
  - ➔ pointing budget of satellites



Mechanical Engineering
Why GRID?

- Example of chaining codes involved in satellite thermo-elastic behaviour predictions



- Results are translated from one code and/or operating system to the others and shared between several users in different places

Mechanical Engineering
Alcatel contribution

- Mechanical Engineering requirements
  - Complete list of users requirements for mechanical engineering
    - Finite elements software NASTRAN/PERMAS
    - Structural analysis linked to NASTRAN/PERMAS in pre or post processing
      - CAD and results visualisation
      - Materials properties
      - Shocks computation
      - Acoustics
      - Fatigue calculation

Mechanical Engineering
Alcatel contribution

- Mechanical Engineering requirements
  - Determine all the possible analyses involving a close coupling between mechanical analyses and other physical domains
  - Determine the needs of these multi-disciplinary activities requiring collaboration between several engineers teams
    - Connections of the codes and computers operating system
    - Data files exchange
    - ...

Mechanical Engineering
Alcatel contribution

- Mechanical Engineering requirements
  - Users requirements in terms of computational network and feasibility
    - Computational resources needed
    - Data sharing and distributing storage
    - Users exchanges from different places
- Mechanical analysis to be tested
  - Real satellite application of collaborative work using GRID infrastructure