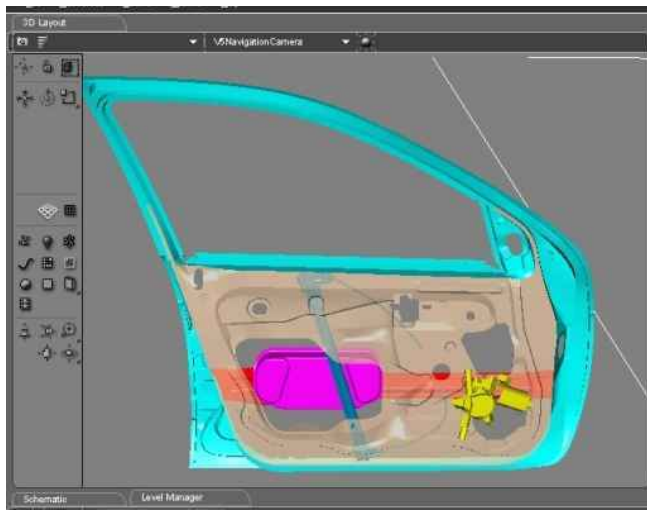


### IPSI

### Interactive Physics Simulation Interface



IPSI (Interactive Physics Simulation Interface) is a software library for physical simulation with force-feedback developed by Haption in collaboration with CEA-List.

IPSI is used in the implementation of:

- IFC Core for Catia
- IPP for Virtools

#### Key Features

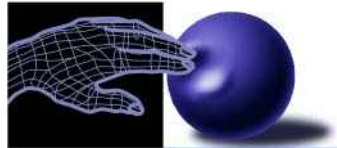
- ⇒ Distributed architecture
- ⇒ Easy implementation of an interactive simulation with collision, weight, constraints
- ⇒ Support of 64bits for large data sets

#### Technical Requirements

- ⇒ Server: Windows XP, Linux. 32bits or 64bits Bi-processeur PC, minimum of 2Gb of RAM, and 2 Ethernet cards.
- ⇒ Client: Windows XP, Linux

**IPSI is a physics engine and a comprehensive solution to stability problems, model complexity and precision issues in case of industrial applications.**

- ✓ Distributed architecture (client/server) based on the ONC RPC (open standard)
- ✓ Multi operating system for the client and the server: Microsoft Windows™, Linux
- ✓ Scenes composed of rigid bodies
- ✓ Simulation of simple kinematics chains (no closed-loop kinematics)
- ✓ Static integration (no inertial forces)
- ✓ 6-dof force-feedback output
- ✓ Compatibility with all the product line Virtuose™
- ✓ Degraded operation without force feedback for 6D mouse (product line 3DConnexion©)
- ✓ Compatibility with optical tracking systems from ART©



# h a p t i o n V I R T U A L T O U C H

## Product | Software

### IPSI Server :

The IPSI server integrates software modules for collision detection (LMD++) and for simulation of movement (GVM) developed by the CEA/List. It also integrates the software library for collision detection VPS™ (Voxmap PointShell) developed by BOEING/Phantom Works.

### IPSI API: C++ library of functions for

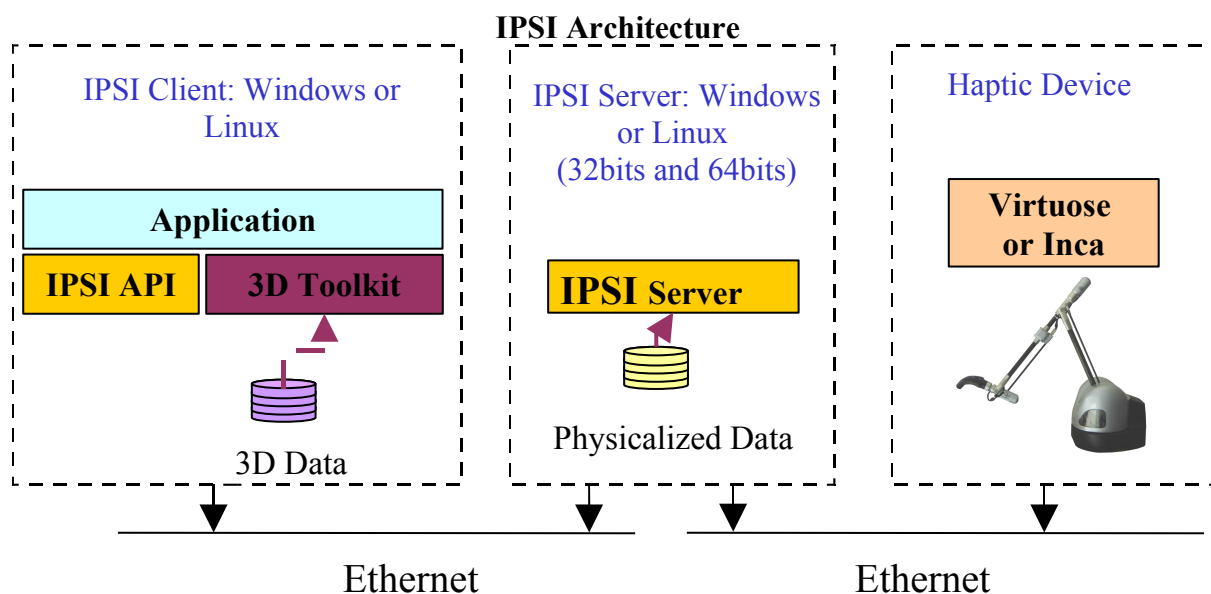
- ✓ Connecting to the IPSI server locally or over the network
- ✓ Loading 3D objects into the scene
- ✓ Selecting interaction-enabled objects
- ✓ Creating simple kinematics constraints (prismatic, plane, pivot, etc ...) and connecting those to objects in the scene
- ✓ Associating interaction devices to objects in the scene
- ✓ Starting/stopping an interactive simulation
- ✓ Updating the position of objects in the scene for visualization

### Level of performances (example)

- ⇒ Dual-Xeon 4 GHz
- ⇒ 300 static objects
- ⇒ 5 moving objects
- ⇒ 3 million polygons
- ⇒ 1 mm precision
- ⇒ 500 Hz frame rate
- ⇒ 4 GByte memory footprint

### Reference customers

- ⇒ The IPSI-enabled product **IFC Core** is used by PSA Peugeot Citroën, Renault, and Dassault Aviation
- ⇒ The IPSI-enabled product **IPP for Virtools** is used by PSA Peugeot Citroën and ENIT



*Note: In case of a simple scene, the IPSI server and client can be run on the same PC.*