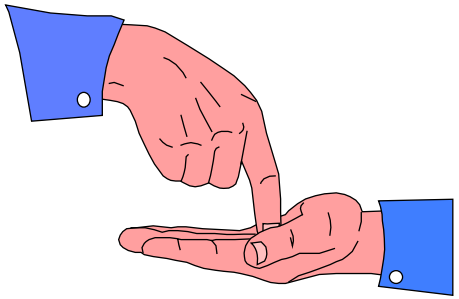
Reusing VHDL Soft-Cores by Means of Using Appropriate Workspace, Management and Navigation Tools

SIDSA & TI+D

There is a clear need for:

- Standards, confidentiality and licensing terms and conditions, legal protection, vendor qualification and certification, customer support and a marketing channel.

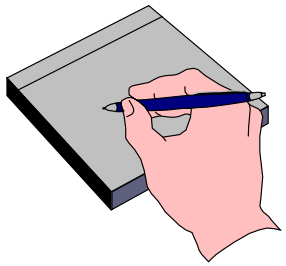
However, even solving all of these NEGOTIATION-BLOCKING issues, the business model can not be solved and presented as a pure IP-Broker activity.

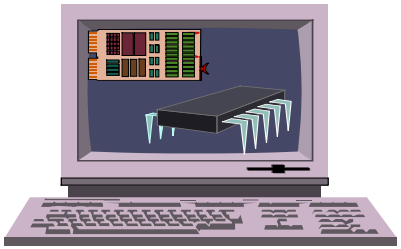


Reusing Soft-Cores implies a lot of engineering and Reengineering support.

Today, it's and Engineer-to-Engineer NEGOTIATION that requires technical experts on both sides of the negotiation, not just salespeople quoting prices and delivery.

This process demands a METHODOLOGY to be supported by a new wave of specific TOOLS and the involved consulting services.

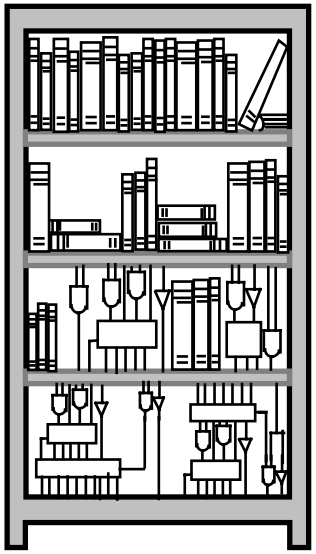




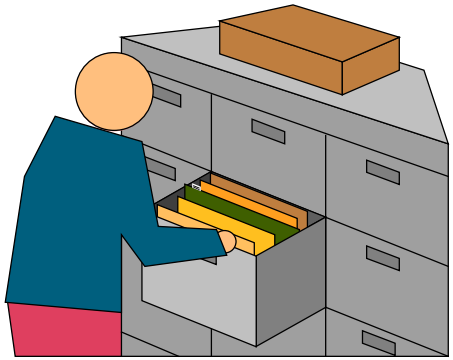
Design Reuse IMPLIES Multiple Access:

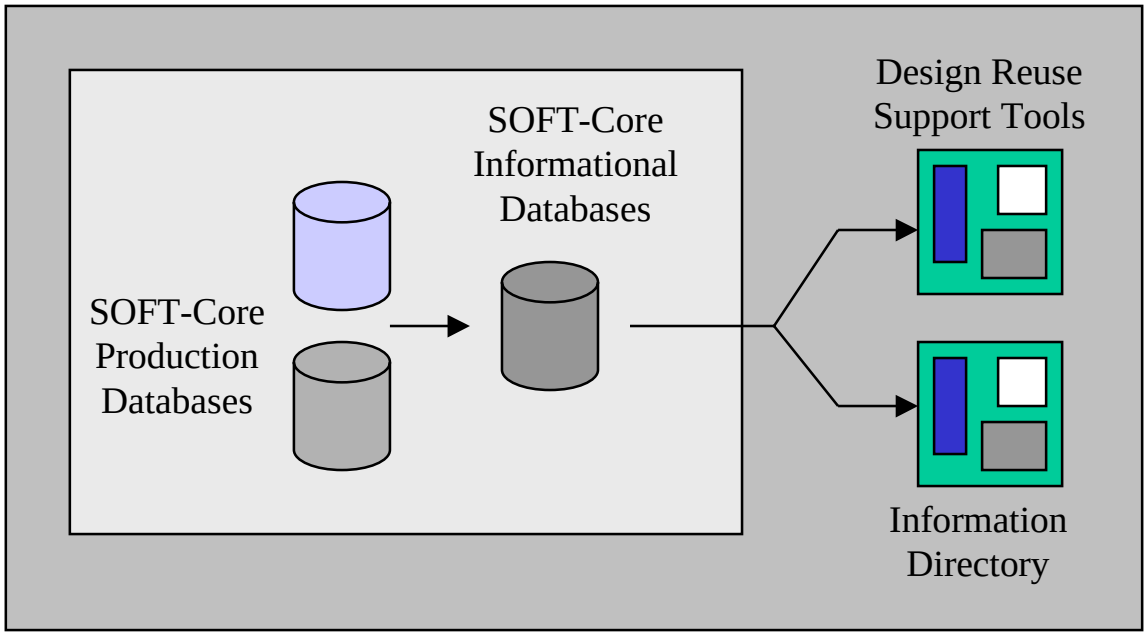
- ONE user SHARING SOFT-Cores in a long period of time during a project or in several projects. The BASIC RE-user action.
- SEVERAL users SHARING among them SOFT-Cores at the same time (producer/consumer interaction) or at different times (RE-user action).

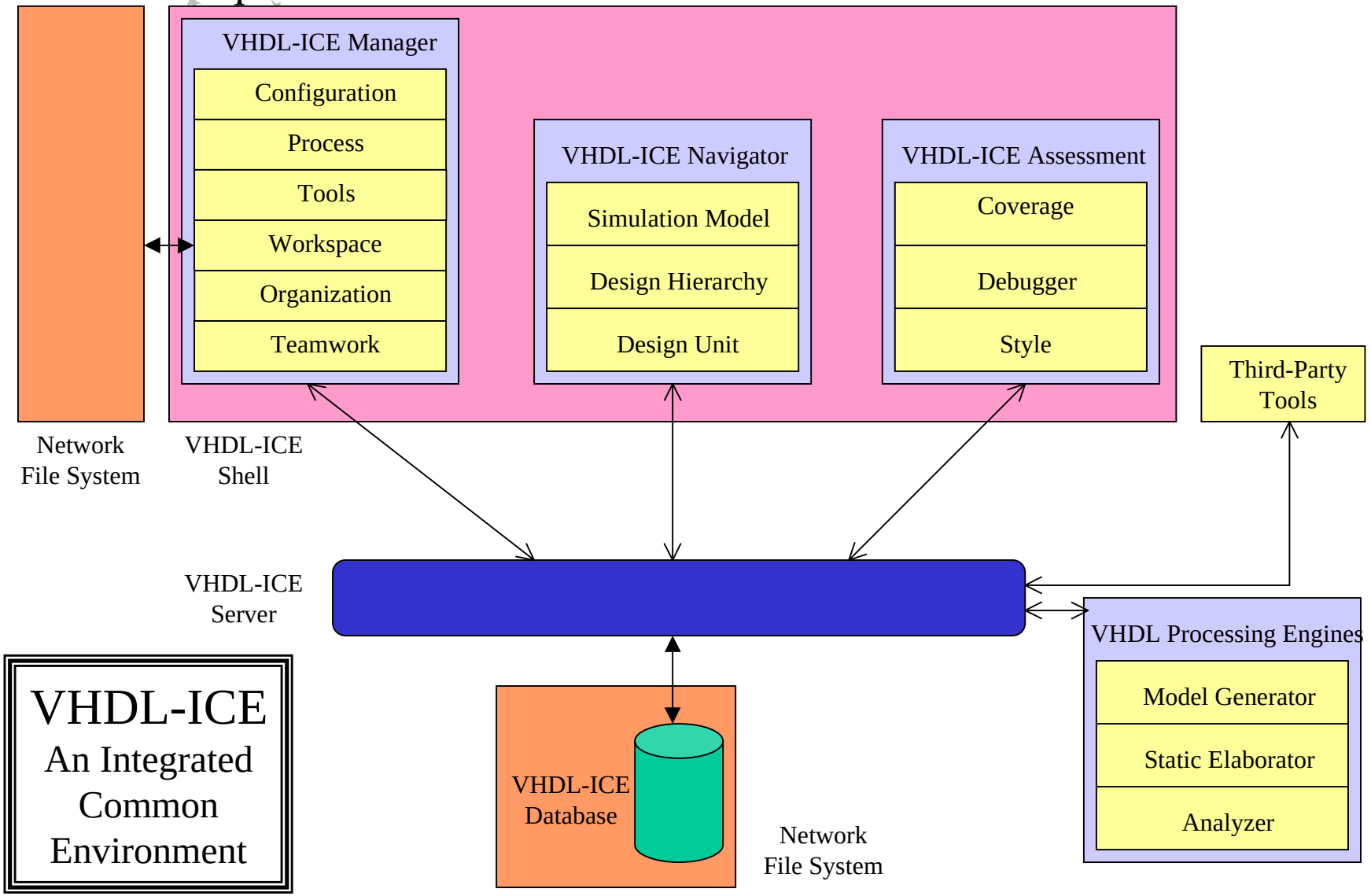
There is a NEED of an Environment for *Managing* and *Reusing* SOFT-Cores supporting MULTIPLE and CONTROLLED ACCESS through the NETWORK.

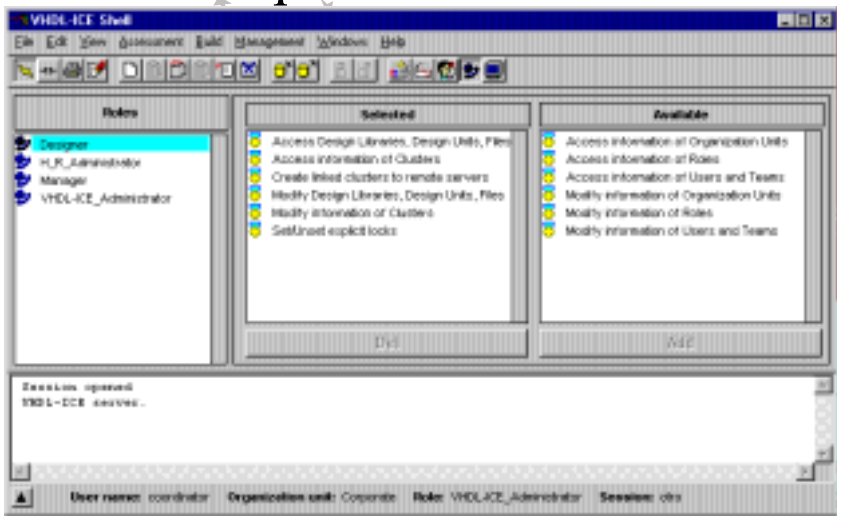


These TOOLS will relay on the MANAGEMENT and EXPLOITATION of the DATABASES where DESIGN LIBRARIES of SOFT-Cores will be stored.

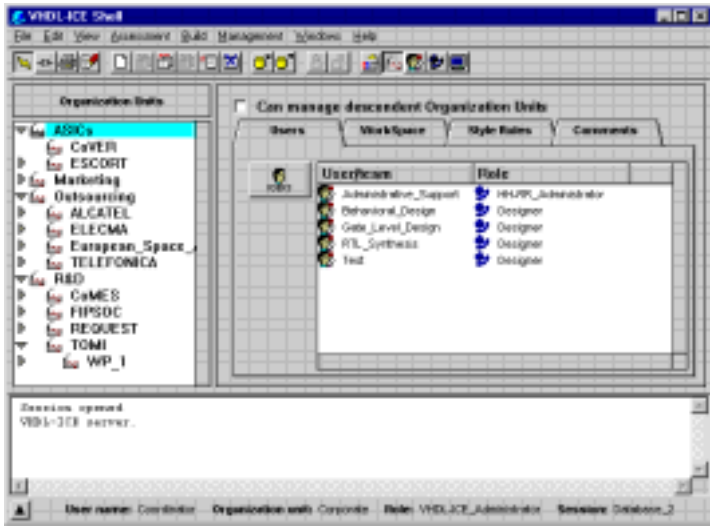




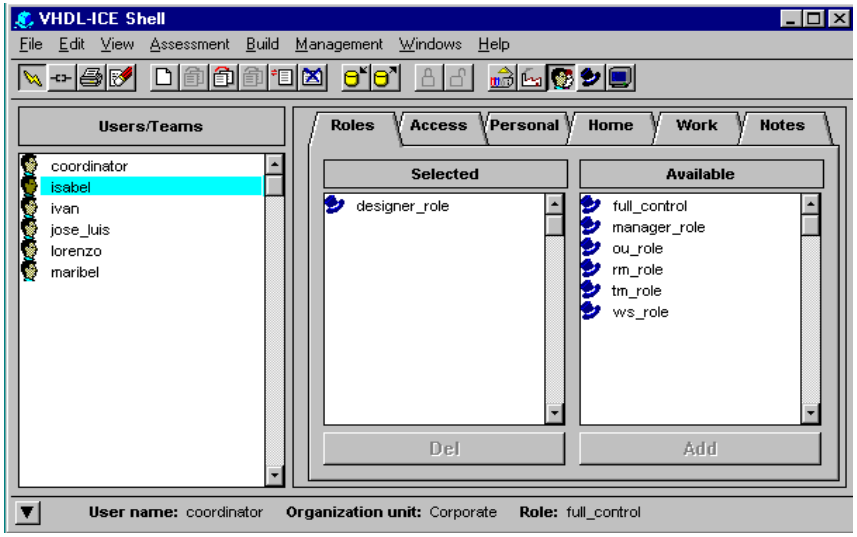

VHDL-ICE Manager
Configuration
Process
Tools
Workspace
Organization
Teamwork
VHDL-ICE Navigator
Simulation Model
Design Hierarchy
Design Unit
VHDL-ICE Assessment
Coverage
Debugger
Style
Third-Party Tools
Network File System
VHDL-ICE Shell
VHDL-ICE Server
VHDL Processing Engines
Model Generator
Static Elaborator
Analyzer
VHDL-ICE Database
Network File System
VHDL-ICE
An Integrated Common Environment



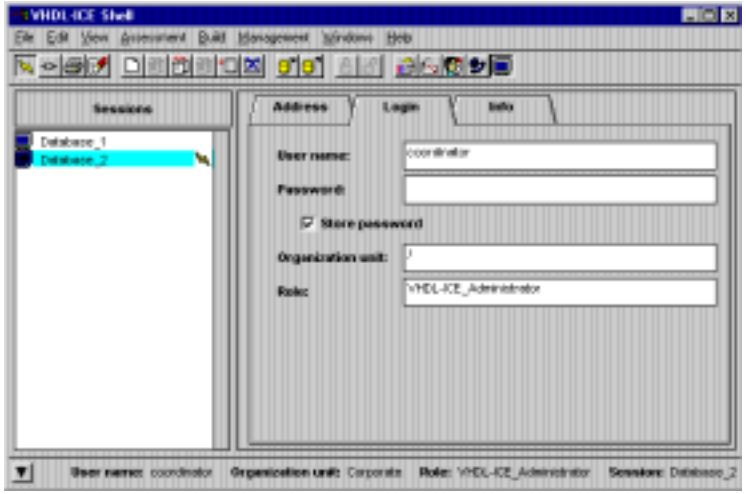
Role-Based Access Control



Organization Units

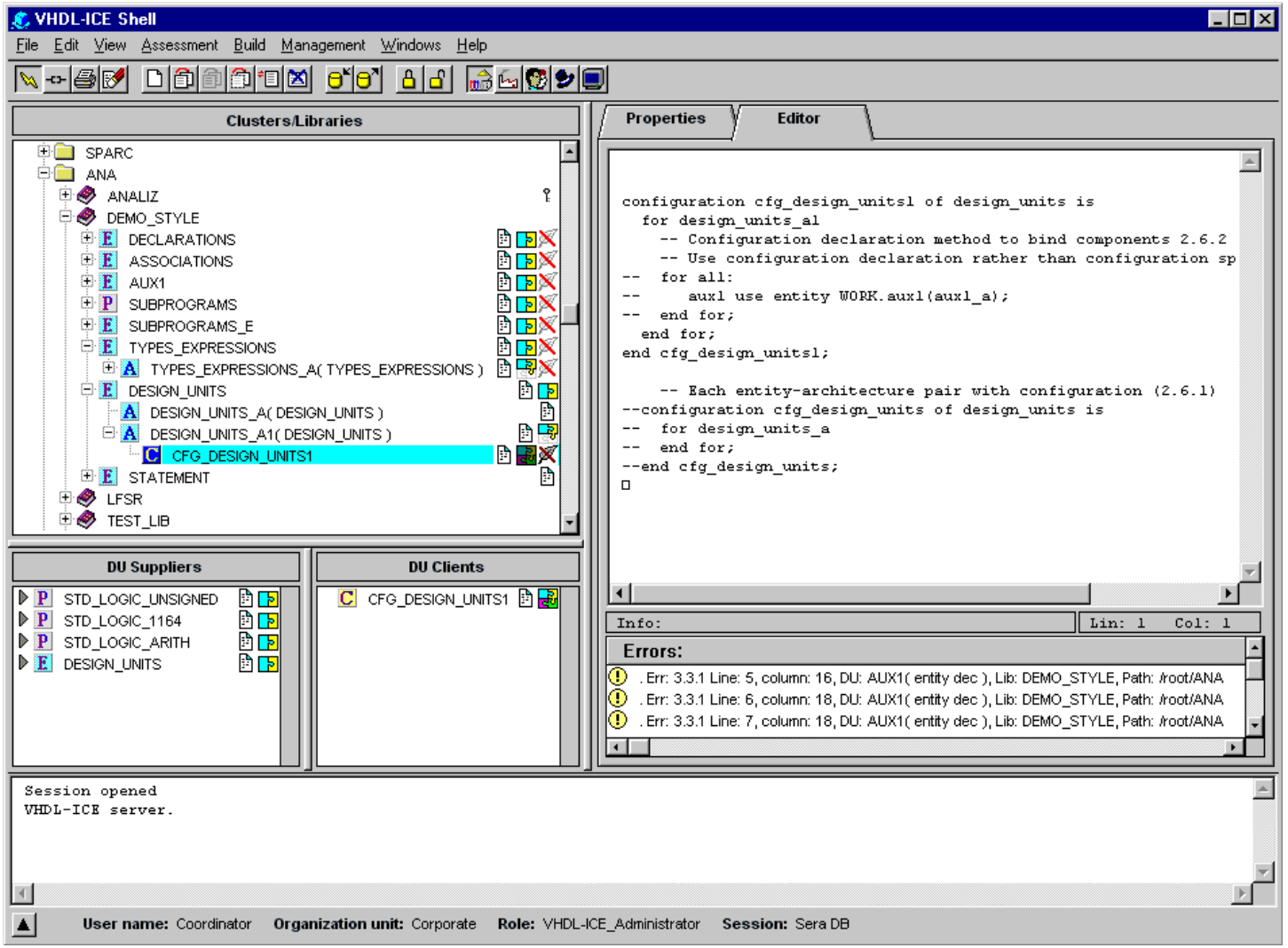


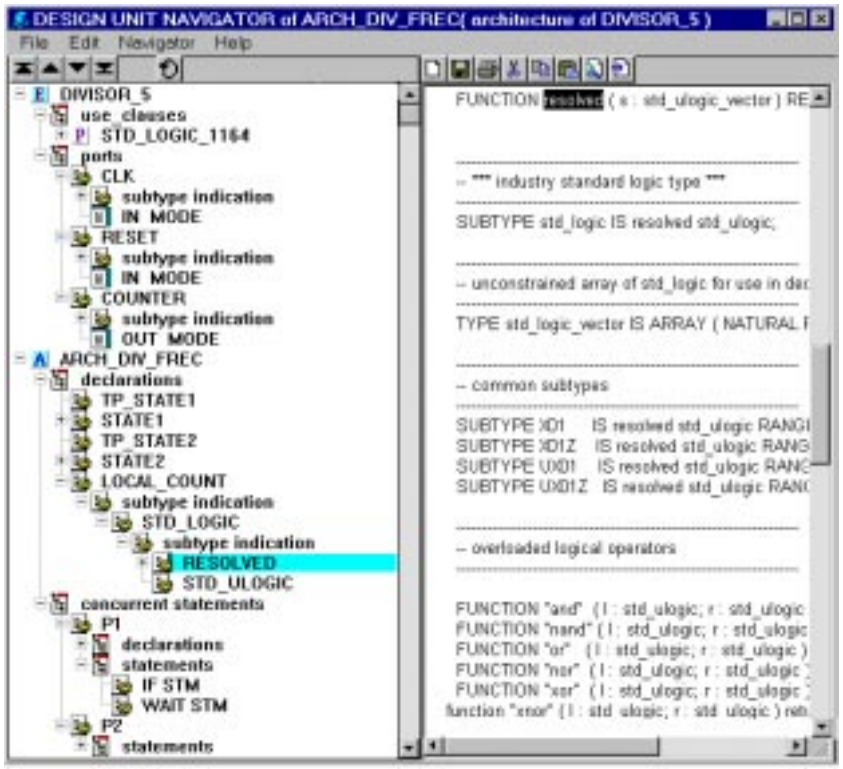
Users and Teamwork

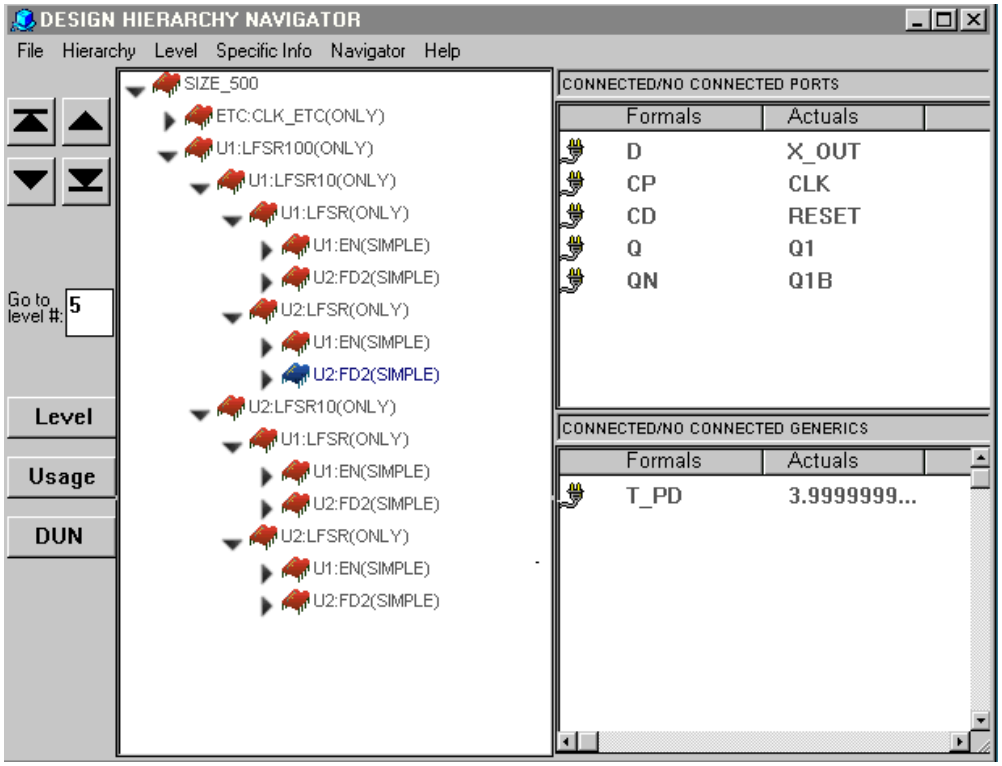


Sessions

Engineering and RE-engineering through Navigation and Style Checking

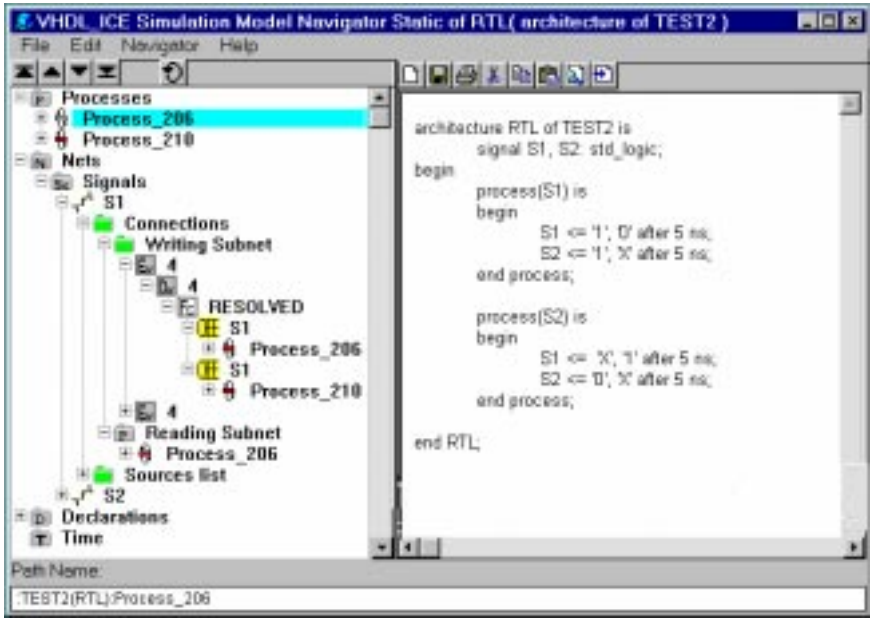




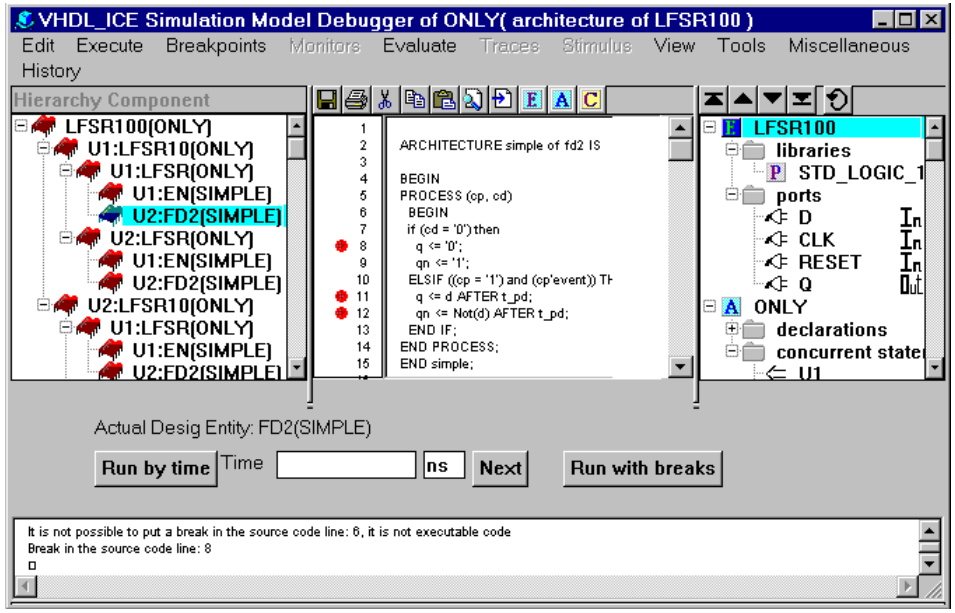


Design Units Navigation

Design Hierarchy Navigation



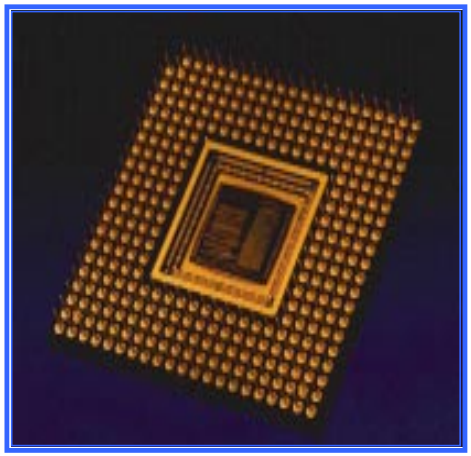
Simulation Model Navigation



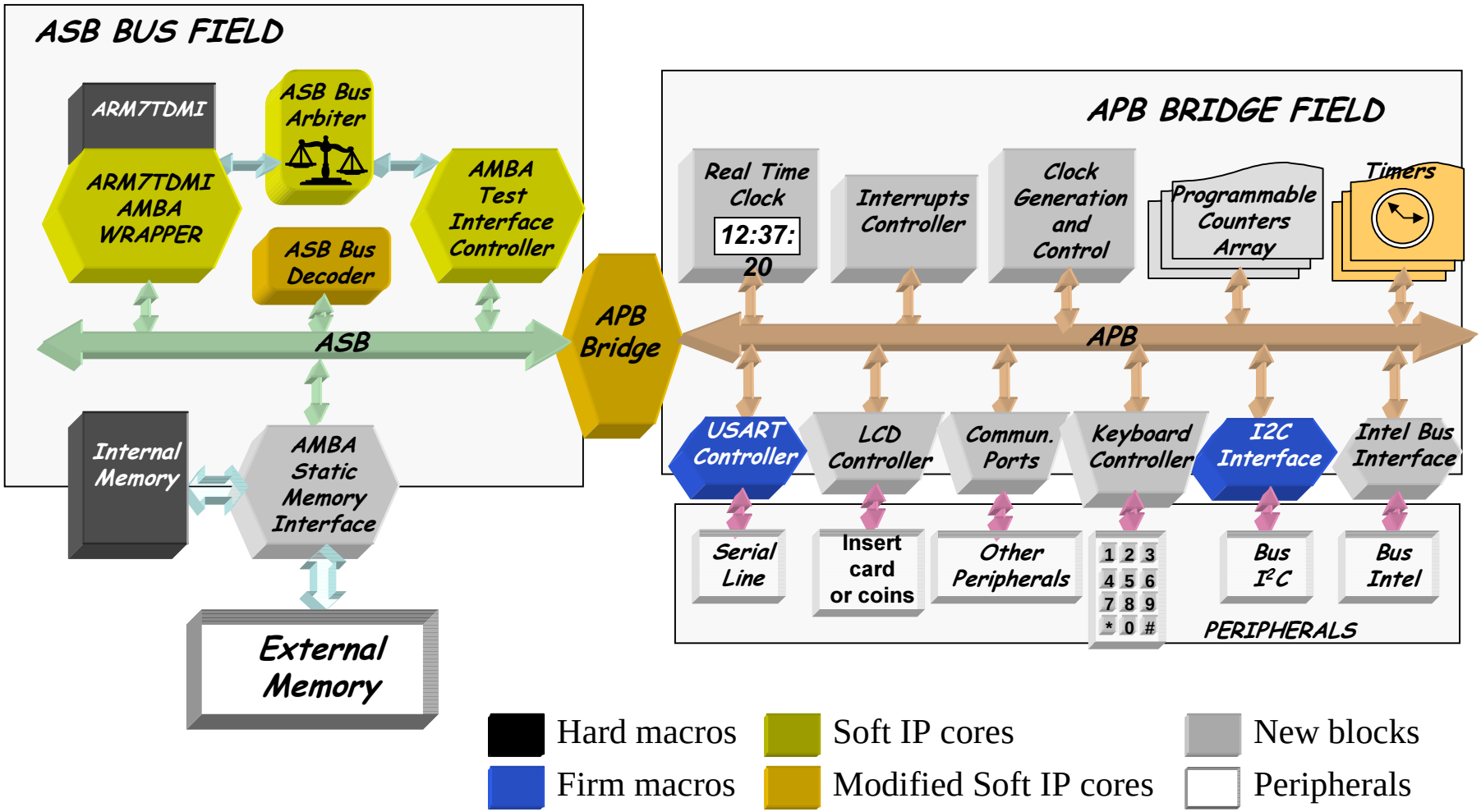
Simulation Debugger

User Application: Micro-controller for Pay Phones

- Include all system functionality
  - Specific hardware device drivers (LCD, keyboard, etc.)
  - Reduction on PCB size and cost.
- Power Management System
  - Very Low “Static” Power consumption (under 150 µA).
  - Processor speed and devices enabling controlled by Sw.
- Based on ARM/AMBA system
  - Usage of IP modules
  - Decoupling Hw/Sw
- Ready for future enhancements:
  - RTOS, Web Services, etc.



Circuit Architecture



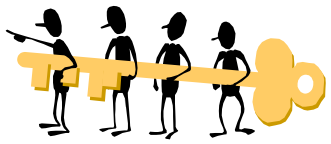
Re-Usage of Soft IP cores in the design flow

Improves productivity

Need for some minor changes in functionality

- Understand the way they work
- Measure of the quality
- Version management

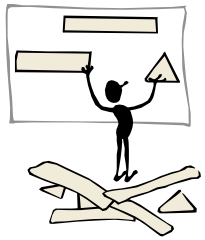
VHDL-ICE Benefits



Management of design teams and role based access control

Analysis and debugging of design units

Uniform design style and quality



Design management and export/import of design structure

Conclusions and Future Work

• The RBAC system of the VHDL-ICE environment to share VHDL Soft-Cores libraries located in a distributed network of databases provides a powerful design reuse framework.

• The VHDL-ICE Workspace and the Navigation Tools have been presented as appropriate tools for design reuse.

• The users' experience has also shown the need for applying some kind of reverse engineering tasks when reusing Soft-Cores.

• Complete VHDL-ICE functionality by the end of 1998.