

Modeling and CAPE-OPEN

How CAPE-OPEN technology may help in the development and maintenance of models?

CAPE-OPEN Laboratories Network



2nd US Annual CAPE-OPEN Meeting

- **Linking Fluent to process simulators**
 - ⇒ **Increased usage by US DOE**
 - ⇒ **New Vision 21 project incorporates CO technology**
- **CO compliant process simulator from US EPA**
 - ⇒ **Released as open source**
- **Demonstration of increased interoperability in thermodynamics and unit operations**
- **IPOPT NLP optimizer made CO compliant by CMU**
- **Commitment by Honeywell on UniSim CO features**





Simulis

Use rigorous thermodynamics in MATLAB through SIMULIS

Properties and equilibrium calculations



Client requirement

Simulis® Thermodynamics

CAPE-OPEN

Property Package

Aspen Properties, PPDS, ...

Simulis Package

CAPE-OPEN

Property Package

Data and results consistency between the different tools...

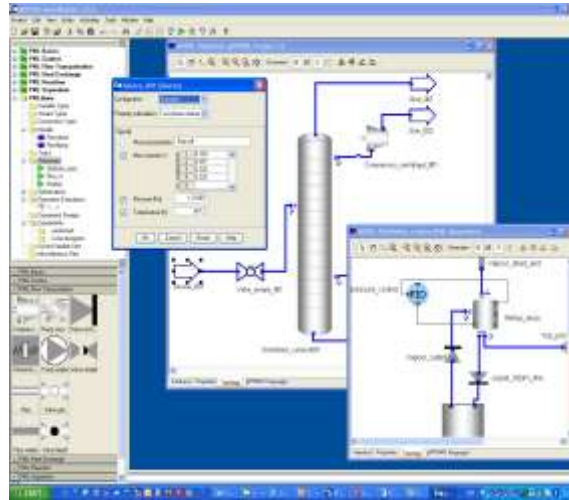
Concentrate on what is really the core a modeling activity...

Aspen Plus, PRO/II, gPROMS, ...

gPROMS CAPE-OPEN Unit Operation



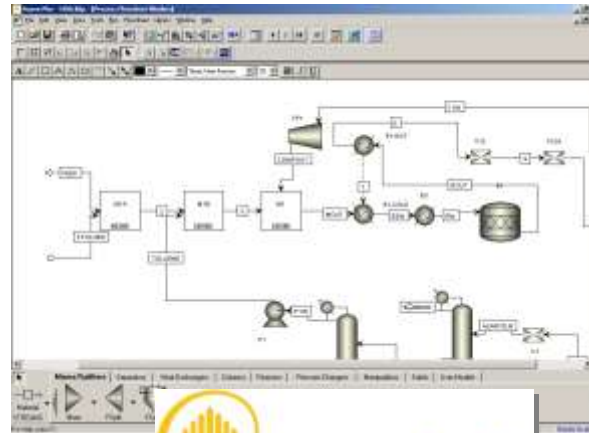
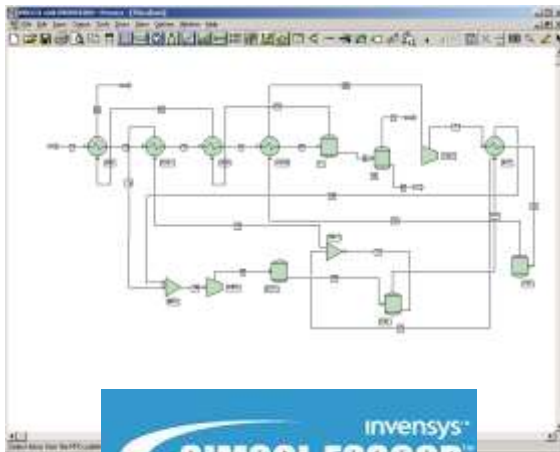
gPROMS
ModelBuilder



Making advanced models
deployable



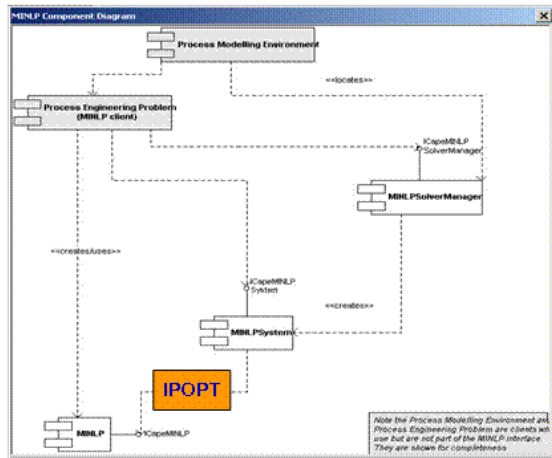
gO:CAPE-OPEN



User Meeting
2005

IPOPT NLP Solver from CMU

- State of the art algorithm
- Made CO Compliant as a COM component



MINLP Problem Creation - C:\Documents and Settings\Yidong\My Documents\My DATA\CAPE-OPEN\From Michel_Tester\CO...

	X1	X2	X3	Y1	Y2	Y3	Log(X2+1)	Log(X1-X2+)	Constant	Type
DF	0	0	-7	5	6	7	18.0	19.2	10	Min

	X1	X2	X3	Y1	Y2	Y3	Log(X2+1)	Log(X1-X2+)	LB	UB
C1	0	0	-8	0	0	0	0.8	0.96	-Inf	0
C2	0	0	-1	0	0	-2	1	1.2	-Inf	2
C3	-1	1	0	0	0	0	0	0	-Inf	0
C4	0	1	0	1	-2	0	0	0	-Inf	0
C5	1	-1	0	0	-2	0	0	0	-Inf	0
C6	0	0	0	1	1	0	0	0	-Inf	1

	X1	X2	X3	Y1	Y2	Y3
Integer	False	False	False	False	False	False
LowerBound	2	0	Inf	0.1	0.2	0.3
UpperBound	4	2	3	1.1	1.2	1.3

Buttons: Load, Save, Clear, Launch

Tested for CO compliance
In the CO Tester

MIILP Solver	Is supported ?
IUnknown	YES
IDispatch	YES
ICapeIdentification	YES
ICapeMINLPSolverManager	YES
ICapeNumericSolver	YES