

A deliverable from CO-LaN to CAPE-OPEN developers and users: the CAPE-OPEN Logging and Testing Tool (COLTT)



Michel PONS¹, Peter Banks², Bertrand Braunschweig³

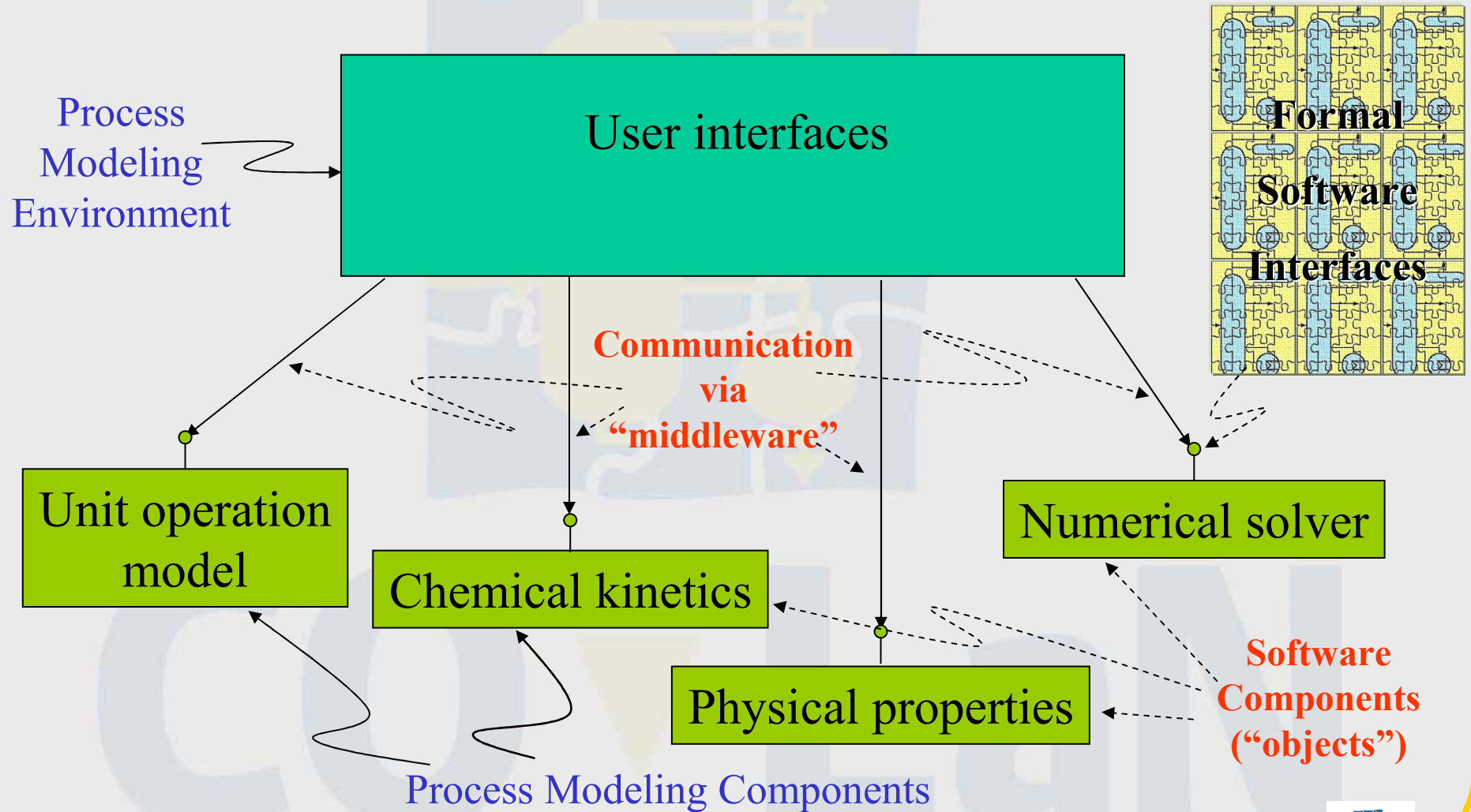
¹CAPE-OPEN Laboratories Network, ²Peter Banks
Associates representing BP, ³IFP

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Bucharest, May 27-30, 2007



CAPE-OPEN in between PME & PMCs



Outline

- ◆ Needs
- ◆ The tool
- ◆ Conclusion & perspectives

CO  LaN



Needs

- ◆ **Users' need: delivery of reliable, seamless interoperability**
 - ⇒ **Facilitate relationship with support teams if problems arise**
- ◆ **Developers' need: reduce learning curve**
 - ⇒ **Lessen cost of adopting CAPE-OPEN**
- ◆ **CO-LaN's goal: accelerate adoption**
 - ⇒ **Get more components and environments available with CAPE-OPEN interfaces**

Solution proposed by CO-LaN

◆ Simplify processes

- ⇒ of developing a CAPE-OPEN compliant component
 - Wizards develop most of the code needed around a CAPE-OPEN component automatically
- ⇒ of testing compliance with CO standards
 - A Tester Suite analyzes the CAPE-OPEN interfaces displayed by a component
- ⇒ of analyzing communication between a PMC and a PME
 - A CAPE-OPEN Logging and Testing Tool (COLTT) reports on CAPE-OPEN transactions between a PME and a PMC

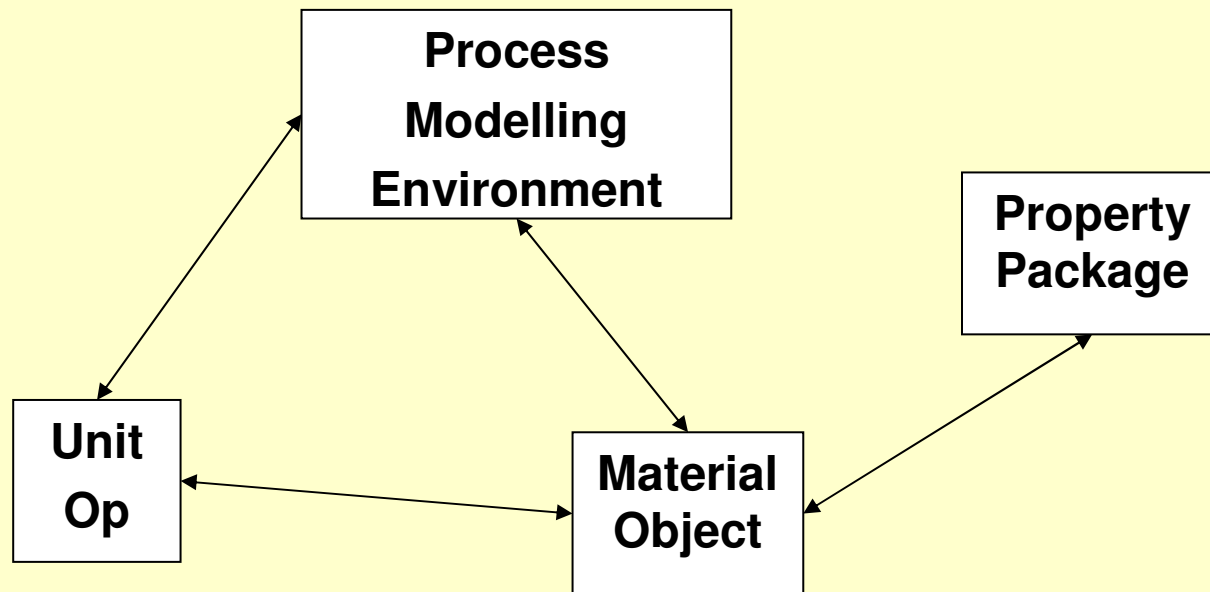


The Tool

- ◆ COLTT applicable to COM objects (Windows) only
- ◆ COLTT intercepts the creation of objects
 - ⇒ Modification of the Windows registry so that the appropriate logger (Unit Operation, Thermo) gets constructed instead of the requested object
- ◆ COLTT constructs the requested object and forwards all calls to it.
 - ⇒ As a consequence CAPE-OPEN PMCs are not loaded differently when they are logged.
- ◆ The logger intercepts method calls by implementing all the interfaces that each type of PMC is expected to support.
- ◆ Windows registry is reinstated at the end of the run.



PME-PMC

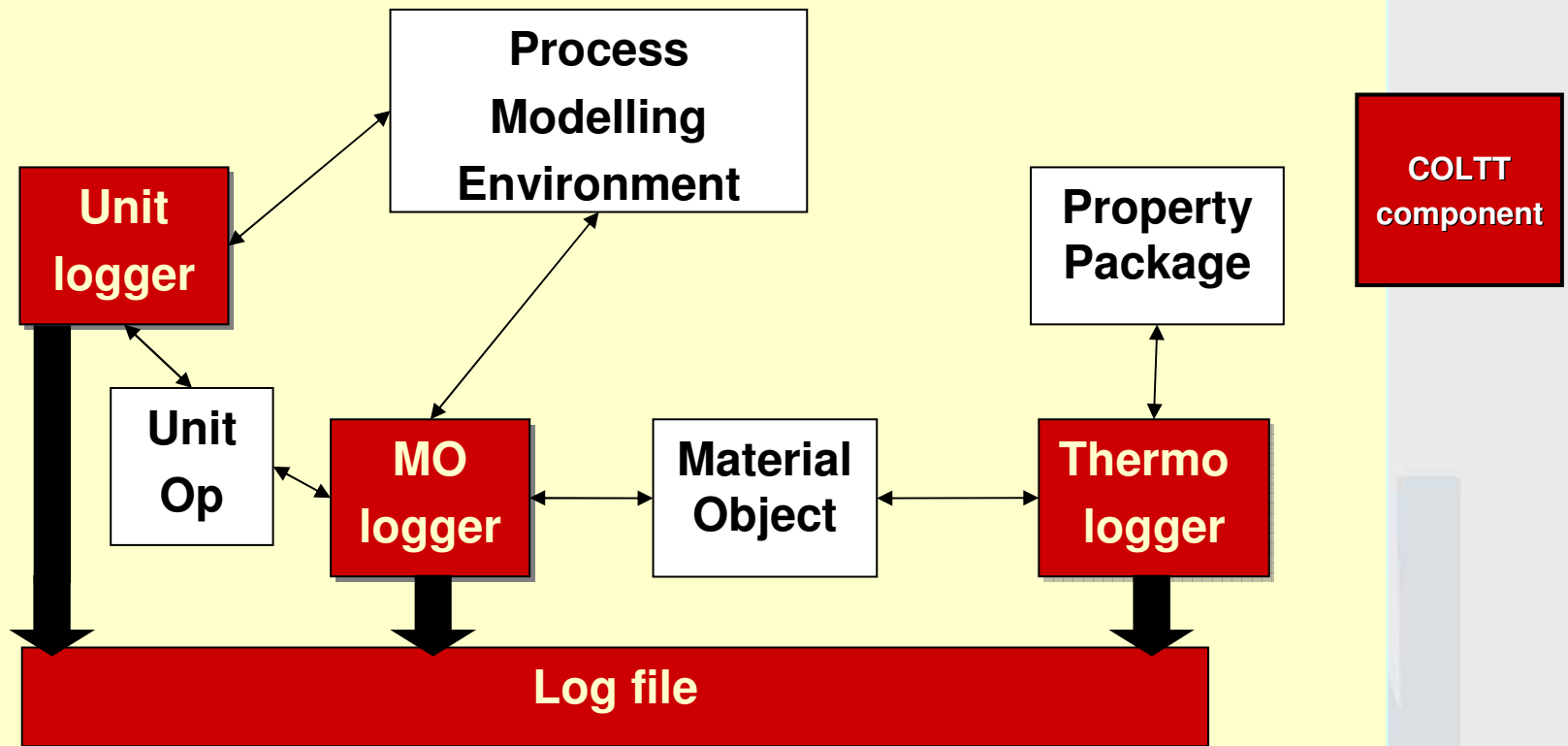


Original
CAPE-OPEN
software



COLTT (simplified)

COLTT components inserted in



COLTT Graphical User Interface

CAPE-OPEN Logging and Testing Tool

Components | Log Files | Real Time Logging

Search
Category: All Components [Go]
Component Name: []
Show Components: Logged Unlogged All

Component Detail

Name: UniSim Thermo server
Description: UniSim Thermo server
About: Property packages will be read from .XML & .CTF files in directory specified in parameter FluidPackagesPath within file HypCOTH.ini (which is in UniSim CAPE-OPEN Kit installation). See 'UniSim Thermo CAPE-OPEN Server v1.0.doc' for more information.
Vendor: <http://www.honeywell.com>
CAPE-OPEN Version: 1.0
Component Version: 1.0
 Enable Logging

Version 1.03 developed for CO-LaN by
SHMA (Pvt) Ltd
Anjum Raheel
+92-345-5088-000
Anjum.Raheel@sidathyder.com.pk
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Contact for Support:
technologyofficer@colan.org

Clear all logs | Close | Help

Enables logging on one or several components

N



Log content

- ◆ COLTT logs all calls made in both directions, via CAPE-OPEN interfaces between a PME and a PMC.
- ◆ Each call to any method from any interface generates a log entry showing:
 - ⇒ Which object made the call
 - ⇒ Which call was made
 - ⇒ Values for the input arguments that were passed
 - ⇒ Return values that were passed back
 - ⇒ Whether the call generated an error and what the error was
 - error codes are explained by a message where possible, or at least translated to a Windows or CAPE-OPEN error name such as E_FAIL or ECapeLimitedImpl.

Detailed log of CAPE-OPEN communication

Log generated by C:\Program Files\AspenTech\Aspen Plus 2004.1\Engine\xeq\apmain.exe
using configuration from C:\Documents and Settings\Michel PONS\Bureau\CAPE
tools\COLTT\CAPE-OPENLogs.ini

ClassFactory : Loading Xist implemented by
c:\PROGRA~1\HTRI\Shared\HTRICO~1.DLL

ClassFactory : Created instance of Xist successfully

ClassFactory : Logging enabled for Unit Operation Xist

Unit : Call to Initialize

Unit : Return from Initialize - 0x0

← Error code returned by method

Unit : Call to put_ComponentName

Unit B1 : Return from put_ComponentName - 0x0

Unit B1 : Call to Load

Unit B1 : Return from Load - 0x0

Unit B1 : Call to put_simulationContext

Unit B1 : Return from put_simulationContext - 0x0

Unit B1 : Call to get_ports

Unit B1 : Return from get_ports - 0x0

Port Collection : Call to Count

Port Collection : Count is 4

← Value returned by method

Port Collection : Return from Count - 0x0

Port Collection : Call to Item requesting Item 1

Port Collection : Return from Item - 0x0

Port : Call to get_ComponentName

Port get_ComponentName returns HotInlet

Port HotInlet : Return from get_ComponentName - 0x0



COLTT development history

- ◆ **Prototyping phase (end 2004 – beginning 2005)**
 - ⇒ **Check of feasibility**
- ◆ **Specification of final tool**
- ◆ **Development production version**
 - ⇒ **Phase I**
 - **Check of workability on 50+ interoperability situations**
 - ⇒ **Phase II**
 - **Resolving difficulties discovered in Phase I**
 - ⇒ **Phase III – Ended March 8, 2007 with v1.0 release**
 - **Developing tool up to specification**
- ◆ **Maintenance of production version (ongoing)**
 - ⇒ **V1.03 available since May 10, 2007**

Systematic testing and analysis

PME	Unit PMC	Thermo PMC
Aspen Plus	HTRI (Xist)	MultiFlash
Aspen HYSYS	ChemSep	PPDS
PRO/II	AixCAPE ShortCut Toolbox	Aspen Properties
gPROMS	Aspentech Mixer-Splitter	COM Thermo
INDISS	gO:CAPE-OPEN Mixer	CPA Property Package
SIMULIS Thermodynamics		SIMULIS Thermodynamics



Suggested workflow with COLTT

- ◆ **Install COLTT on your machine (MSI file provided to CO-LaN membership)**
 - ⇒ **Includes logging controller**
 - ⇒ **Includes various loggers**
- ◆ **Define logging output (file)**
- ◆ **Enable logging on PMC(s) via Logging controller**
- ◆ **Run the simulation between PME and PMC(s)**
- ◆ **Disable logging on PMC(s) via Logging controller**
- ◆ **Analyze log**



Conclusion & perspectives

- ◆ **Availability of COLTT**
 - ⇒ **CO-LaN membership (60+ organizations)**
- ◆ **On-going actions by CO-LaN to facilitate the development of reliable CO components**
 - ⇒ **Compliance of COLTT with Thermo interface specification version 1.1 released Oct 06. To be released in July 2007.**
- ◆ **Your feedback appreciated in pointing out how COLTT can be made more user-friendly**



Contributions from Michael Halloran, formerly from Aspentech, and from SHMA Ltd in Pakistan are gratefully acknowledged

Next CAPE-OPEN events this year

CAPE-OPEN session at ICheaP-8, Ischia, June 24-27

CAPE-OPEN session at ECCE-6, Copenhagen, Sep 16-21

4th CAPE-OPEN US Conference, Salt Lake City, Nov 4-9

**Thank you
Questions?**

