Methods and Tools
Special Interest Group Report
October 2019 – September 2020

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14 October 2020

SIG Membership

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Tony Garratt
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Shell Global Solutions

Michael Hlavinka
Bryan Research & Engineering, LLC

Loic d'Anterroches
Céondo GmbH

David Jerome and Krishna Penukonda
AVEVA

M&T SIG Ongoing Activities

- Typically four conference calls per month. Calls are held on Wednesdays at 1700 CET, 1100 US Eastern Time, 1000 US Central Time.
  - General SIG business on the 1st, 2nd and 4th Wednesday of the month
  - Threading conference call on 3rd Wednesday of the month
- Joint Conference call with Interop SIG, typically 3rd Wednesday of the month at 2100 CET, 1500 US Eastern Time, 1400 US Central Time.
- Join? Please contact either SIG Leader or CTO
  - Bill Barrett – barrett.williamm@epa.gov
  - Michel Pons - technologyofficer@colan.org

M&T SIG Charter

- Improve integration and expand utilization of Computer-Aided Process Engineering (CAPE) applications within the enterprise through identification and resolution of existing cross-cutting issues with the CAPE-OPEN platform, develop mechanisms for use of CAPE within other application domains, and incorporate advances in information technology into the CAPE-OPEN platform.

- Key responsibilities
  - Resolve issues with the common interface specifications.
  - Develop and maintain standards and protocols for CAPE-OPEN implementations.
  - Incorporate advances in information technology into the CAPE-OPEN protocols.
  - Identify novel uses of CAPE and provide standards for utilizing CAPE within these applications.

No change to vision and responsibilities.

M&T SIG 2019/2020 Summary of Activities

- Provided advice about licensing to the Management Board.
- COBIA Development and Testing
  - Development, Testing and **Release** of End-User Redistributable and SDK
  - Transitioning of persisted objects from COM to COBIA.
- Interaction with Interop SIG
  - Support for distribution of CO-LaN products
  - Versioning Proposal
- Continue Development of New Interface Specifications
  - Persistence Interfaces
  - Parameter Interfaces
  - Economics/Currency Interfaces
  - Reporting Interface

Licensing

- Developed by Management Board with M&T Input.
- Helped MB define CO-LaN Intellectual Property
  - Abstract Specifications
    - Interface Specification Documents
    - Approved PDF Documents are distributed
  - Implementation Specifications
    - Interface Definition Language (IDL) Source Code
    - Type Libraries and Primary Interop Assemblies
  - Distributed Software
    - COBIA Middleware and SDK
    - COLTT
- Provided input on the impact of licensing on the usage of these products

Versioning Proposal

- **CO-LaN Intellectual Property Is Versioned.**
  - Enables the identification and consistent use across different versions of the interface specification.
  - Provides a means to identify and track changes made in the interface specifications and software that implement or consume the interfaces

- **Nature of Changes**
  - Breaking change – a change to the interface specification document that fundamentally alters the interactions between CAPE-OPEN-based applications.
  - Feature Addition (Extensions) – adding a feature does not typically alter the way current components interact in a CAPE-OPEN application.
  - Bug fixes, patches, Errata and Clarifications (E&C) – these are minor revisions that improve the functionality, performance or usability of the product, but do not add features or affect interoperation.

Versioning Proposal

- **Version Numbering Scheme - *Major.Minor.Patch.(Revision* or *Build)***
  - ***Major*** **and** ***minor*** **version numbers are changed if the change is a breaking change.**
    - ***Major*** **version number will be incremented if the breaking changes are considered major.**
    - ***Minor*** **version number indicates that the breaking change is considered minor.**
  - ***Patch*** **version number will be incremented when a feature addition (extension) of the specification document requires modification of the distributed software libraries that is only an additive change. The major and minor version numbers will remain the same.**
  - ***Revision*** **or** ***build*** **number is updated when a patch or bug fix is released.**

- **The Interoperability SIG will have the final decision on incrementation of the version numbers.**

Version Compatibility

- Both PMEs and PMCs may support multiple *major.minor* versions.
- GUIDs for interfaces, Enums, and CATIDs are specific to a *major.minor* version number. **Breaking changes break everything.**
- To interact, the PME and any PMC must use the same *major.minor* version.
- The PME and PMC should use the highest common *major.minor* version.
- *Patch* and *Build* version numbers are incremented for feature additions, bug fixes, patches, and Errata and Clarifications (E&C).
  - These are not breaking changes.
  - No impact interoperability between CAPE-OPEN implementations having the same major and minor version number.

Adoption of Versioning

- **CAPE-OPEN version 1.1.X (COM and .NET)**
  - Add Flowsheet Monitoring, Custom Data, and Reactions (when available)

- **CAPE-OPEN version 1.2 (COBIA ONLY)**
  - Replace the Persistence, Utilities, and Parameter Common Interface Specification.
  - Remove the ICapeUnitReport interface contained in the Unit Operation Interface Specification
  - Add new Reporting Common Interface Specification.
  - Remove the ICapeMaterialTemplateSystem Interface from the COSE Interface Specification.
  - Make changes to Thermodynamic Business Interfaces being proposed by the Thermo SIG.
  - Update all Interface Identifiers (IID) Globally Unique Identifiers (GUID) and create a new Category Identifier (CAT_ID) for CAPE-OPEN Components implementing version 1.2.

- **CAPE-OPEN version 2.0 (FUTURE OUTLOOK)**
  - Incorporates interface changes in CAPE-OPEN 1.2
  - SIGs asked to review and modify their Business Interface Specification Documents to facilitate release of CAPE-OPEN version 2.0.
    - Updated Interface Specification and Implementation Specifications
  - Update all Interface Identifiers (IID) Globally Unique Identifiers (GUID) and create a new Category Identifier (CAT_ID) for CAPE-OPEN Components implementing version 2.0.
  - No PIA. Use .NET version 4.x Type Equivalence.

COBIA Project Roadmap

- Phase I – Proof of Concept **Completed**
  - Core technical components
  - Demonstrate COM/COBIA interoperability with Thermo 1.1 interface set
- Phase II – Full Windows Native **Completed**
  - Expanding COBIA to all interfaces of business value
  - Support for C/C++ development.
  - Allow development of fully functional COBIA-based PMEs and PMCs
- **Release of Phase II – Jasper will present.**
- **Phase III – Interoperability (Future)**
  - **Microsoft .NET is planned – 2020/2021**
  - **Other platforms as identified by CO-LaN membership**

COBIA Timeline

- October 2016 - Phase I (Proof of concept) completed
- October 2017 – Phase II (C/C++ Application Framework) status presented and demonstrated
- October 2018 – Early adopter version of COBIA
  - COBIA Training
  - Testing, bug fixes and third-party use of COBIA
- April 2019 – MB support for KBC and HTRI development
- September 2020 – Release of COBIA Runtime and SDK for application development
- FUTURE
  - Scope and Create Required COBIA Documentation
    - E.g. Transitioning and Threading
  - Develop .NET language bindings
  - Other language bindings (Develop if there is a business case)
  - CO-LaN will maintain COBIA codebase and provide updates as needed.

COBIA 2020/2021 Activities

- Maintenance of End-User Redistributable and SDK installers
- Deployed Symbol Server @ https://symbols.colan.org
- Transitioning of persisted objects from COM to COBIA.
- Scoping of Phase III.
  - Threading model development
  - Marshaling
  - Language bindings, proposal includes:
    - .NET
    - Python
    - Java
    - Fortran

General 2020/2021 Deliverables

- **Develop textual interface specifications and RFC.**
  - Parameters
  - Persistence
  - Reporting
  - Error Handling
- **Work with Interop SIG**
  - Testing and Evaluation of COBIA
  - Certification Tools
  - Installation Packages

Thank you For Your Attention

- **Any Questions?**