

Business Requirements of Certification

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Overview

- **Levels of certification**
 - **Options**
 - **Strengths & Weaknesses**
- **Business Models**
 - **Options**
 - **OPC Foundation Certification**
 - **Establishing the cost**
- **Draft Certification Process**
- **Delivery of Test Suite**

- **Discussion**

Levels of Certification - Options

- **Stand-alone testing of interface functionality**
 - **Demonstrates that implementation meets the standard and should provide interoperability with other software which also passes the same tests**
 - **Needs test harnesses available**

Levels of Certification - Options

- Stand-alone testing of interface functionality
- Stand-alone testing of features and best practice
 - For example, generate a list of features for each of the following categories:
 - Flash types (PT, PH,)
 - Pure component properties
 - Mixture properties
 - If software assumes “mass” if not “mole”, advise better to check for both
 - Allows the end-user to determine (by inspection) if the software could meet their business requirements

Levels of Certification - Options

- Stand-alone testing of interface functionality
- Stand-alone testing of features and best practice
- One-to-one testing of software A with software B
 - Against generic test scenarios
 - Demonstrates that specific combinations of CAPE-OPEN compatible software will interoperate
 - But only against the generic test scenarios
 - Requires both A and B to be installed on the same machine

Levels of Certification - Options

- **Stand-alone testing of interface functionality**
- **Stand-alone testing of features and best practice**
- **One-to-one testing of software A with software B**
- **One-to-one testing of Software A with software B to meet specific (current) business requirements of a single end-user**
 - **Guarantees (?) end-user requirements will be met**
 - **Requires both A and B to be installed on the same hardware**
 - **Business requirements are likely to be end-user confidential**

Levels of Certification – Strengths & Weaknesses

□ Stand-alone testing of interface functionality

■ Strengths

- Improves likelihood of successful interoperability
- Quick
- Can be done by vendor or CO-LaN
- PMC testing can be automated

■ Weaknesses

- Reliant on coverage and reliability of test harness
- PME testing can only be automated by each vendor independently
- Doesn't guarantee interoperability between Software A and B
- CO-LaN needs funding to develop and maintain test harnesses
- CO-LaN needs funding to review test reports and grant certificate

Levels of Certification – Strengths & Weaknesses

- Stand-alone testing of interface functionality
- Stand-alone testing of features and best practice
 - Strengths
 - Improves likelihood that software will meet end-user business requirements
 - PMC testing can be automated
 - Can be done by vendor
 - Weaknesses
 - PME feature requirements depend on scope of PME
 - Difficult to automate testing of PME
 - PMC written for specific purposes may not necessarily meet “normal” best practice
 - If a PMC does not provide a “best practice” feature, some PMEs may still be able to interoperate with it if they provide a work-around
 - Additional development of test harness required, higher cost for CO-LaN

Levels of Certification – Strengths & Weaknesses

- Stand-alone testing of interface functionality
- Stand-alone testing of features and best practice
- One-to-one testing of software A with software B
 - Strengths
 - Guarantees the combination will interoperate in pre-defined generic scenarios
 - Weaknesses
 - Time consuming, therefore expensive
 - Only tests against generic scenarios
 - Both Software A and B need to be installed on the same hardware

Levels of Certification – Strengths & Weaknesses

- Stand-alone testing of interface functionality
- Stand-alone testing of features and best practice
- One-to-one testing of software A with software B
- One-to-one testing of Software A with software B to meet specific (current) business requirements of a single end-user
 - Strengths
 - Guarantees that combination will meet the end-user requirement
 - Weaknesses
 - Time-consuming, therefore expensive
 - Needs to be repeated for every new business requirement with different functionality
 - Both Software A and B need to be installed on the same hardware
 - Business requirement likely to be confidential

Business Models - Options

- **CO-LaN Full members fund all costs**
 - **Would either need to increase number of full members, or increase annual fee per member**
 - **No barrier to certification for vendors**
 - **Why should the small number of end-users actively participating in CO-LaN fund certification for the entire CAPE-OPEN community?**

Business Models - Options

- **CO-LaN Full members fund all costs**
- **Charge all Associate Members an annual fee, which includes certification**
 - **Encourages all vendors to certify, as they are paying for it anyway**
 - **Spreads the cost amongst a large(r) group**
 - **Some Associate members do not have any software that requires certification**

Business Models - Options

- **CO-LaN Full members fund all costs**
- **Charge all Associate Members an annual fee, which includes certification**
- **Annual fee for all vendors signing up for certification**
 - **Fee level needs to be low enough to not be a barrier for (especially) small vendors and research organisations**
 - **CO-LaN Associate Members / Full Members receive a discounted rate**
 - **Fee level based on size of organisation? Complex, difficult to define “size” of each organisation in an equitable way**
 - **Actual level of fee would depend on number of vendors signed up for certification and the required budget**

Business Models - Options

- ❑ **CO-LaN Full members fund all costs**
- ❑ **Charge all Associate Members an annual fee, which includes certification**
- ❑ **Annual fee for all vendors signing up for certification**
- ❑ **Charge for test harness software**
 - **Very similar to annual fee?**
 - **But income level more variable than with an annual fee?**
 - **Would need to charge for each new version of software to ensure a continuous income stream**
 - **Incompatible with open source software?**

Business Models - Options

- **CO-LaN Full members fund all costs**
- **Charge all Associate Members an annual fee, which includes certification**
- **Annual fee for all vendors signing up for certification**
- **Charge for test harness software**
- **Charge individual vendors for all CO-LaN time spent on certification**
 - **Cover man-hour and software costs with a single charge**
 - **Assumes that CO-LaN spends a significant time that can be allocated to an individual vendor in certification process**
 - **Only therefore applicable if one-to-one testing of software by CO-LaN?**

Business Models – OPC Foundation

□ Aims

- Compliant with the OPC specifications
- Interoperable with other OPC products from other vendors
- Robust, reliable and able to recover from lost communications, etc.
- Usable, by following universally accepted best-practices
- Efficient in managing resources (CPU, memory, disk space etc.)

□ Certification undertaken by OPC, via “Certification Lab”

□ OPC endorses Interoperability Workshops

□ Business Model

- Charging for test software
 - Free to members, charge for non-members
- Daily rate for final certification:
 - Corporate Members: US\$950 per day
 - Logo-members: US\$1900 per day

Business Models – Establishing the cost

- **Development/maintenance of CO-LaN provided test software**
 - **CO-LaN cost**
- **Performing tests on specific implementations and (if required) developing PME test procedures**
 - **Vendor cost**
 - **Vendor may choose to do in-house or employ a contractor**
- **CO-LaN review of test reports and granting of certification**
 - **CO-LaN cost**
- **One-to-one testing of Software A with Software B**
 - **Vendor or end-user cost**
 - **CO-LaN may choose to provide an independent testing environment**
 - **but the cost would be charged to the vendor or end-user company requesting the testing**

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CO-LaN needs funding for items in red

CO-LaN will not aim to make a surplus on certification

(Draft) Certification Process

- **Vendor downloads test suite and tests their software**
 - Can be used during software development
- **Vendor runs test suite on final “frozen” version, generates report and submit to CO-LaN**
 - **Test Report will contain a hierarchy of results:**
 - Test successful
 - Tested interface / property not implemented
 - E.g. entropy, TS flash, heat of formation
 - Interface /property must not be mandatory
 - Test failed
 - Including missing mandatory interfaces
- **Vendor requests certification from CO-LaN**

(Draft) Certification Process (cont.)

- **CO-LaN reviews reports and confirms that**
 - Tests were performed in the correct way
 - No critical failures have been reported
 - Certificate (for example Self-Tested Thermo PMC) can be granted
 - Test results need to be published
- **Questions:**
 - Test report may require sanitisation before publishing?
 - Test report should be
 - freely available to everyone?
 - Only available to CO-LaN members?
 - Available to non-members via a fee?
- **Note that CO-LaN provides Certification Approval:**
 - For the specific version of the software tested
 - For specific version of the test suite
 - For the CO interfaces implemented in the software
 - Up to the vendor as to which versions of their software they test

Delivery of Test Suite

- **CO-LaN currently has insufficient resource to deliver & maintain the Test Suite necessary for Certification**
- **Request for Bids**
 - **For additional contractor**
 - **To support all of:**
 - **CAPE-OPEN Logging and Testing Tool (COLTT) and associated installer**
 - **Type library, Primary Interop Assemblies (PIA) and associated installer**
 - **Certification self-test suite**
 - **Software and installers**

Delivery of Test Suite – Skills required

- ❑ Knowledge of the CAPE-OPEN standards
- ❑ Software installation, in particular
 - Windows Installer
 - WiX Scripting
- ❑ Understanding of 32-bit and 64-bit Windows registry
- ❑ .NET / .NET assembly language
- ❑ The languages used in the development of the software to be supported (C++ / C# / Microsoft IDL)
- ❑ Software testing and debugging

Delivery of Test Suite – Current Status

- RfB closed on 30th September 2019
- Only 2 responses
 - Neither of which have time available to fulfil the entire role
- Next steps?
 - Accept one or both of the responses to the RfB
 - Ask if anyone else at the Annual meeting is able to submit a response, even though we are now after the closure deadline
 - Issue the RfB to a wider community, for example the general software developer community, even if they have no CAPE-OPEN experience or knowledge of the standards

Thank You!