



Winning the Battle for Interoperability

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End users who purchase OPC-compliant products expect 24/7 reliability, full data information integrity and validated, secure interoperability. The product should seamlessly integrate with existing architecture. However, achieving interoperability of some products is more like a running skirmish against hostile opposition -- painful and costly. Getting all sides to comply with the rules and best practices of interoperability can be an uphill battle at times. To combat the problem, the OPC Foundation has created the OPC Enhanced Certification Program.

The clear message from users was they should not need to validate interoperability between vendors. As an industry standard, OPC products should work together seamlessly, securely and reliably. So, when the status quo isn't sufficient and you foresee marauding forces gathering on the rise, what do you do? Form a battle plan, strengthen the defenses, check the armaments and rally the troops. Achieving the mission on true interoperability takes no less effort. Paul Hunkar, Consultant Engineer with ABB, in his role as the OPC Foundation Managing Director of Certification is the one tasked with leading the charge. *"The OPC Foundation is committed to providing the support requested by our end-users and vendors to improve the quality of OPC Products."* says Hunkar. *"The Compliance Committee, composed of end users, vendors and system integrators, has spent significant time and resources improving the processes available to vendors to improve the quality of their products"*

The Battle Plan

A good commander will tell you any battle plan relies on good reconnaissance, so existing OPC vendors and end users were surveyed to determine what was working with the existing compliance procedures, and to identify possible chinks in the armor. The key observations included:

- current compliance efforts lacked visibility
- it was not easy to identify OPC product certification levels
- there was a demand for independent testing facilities and improved testing tools

The OPC Foundation currently provides workshops and automated test tools to help facilitate interoperability. Although these efforts are effective to a certain degree, it was deemed additional improvements where needed to ensure the delivery of quality certified products that exceeded the expectations of the end-user community.

Initial Tactics

The OPC Product Certification section of the Foundation website has been re-designed to make it easier to find OPC-certified applications. Each product has a 'Certification Test Status' associated with each specification that it supports. In addition, each product has an overall test status, which is a composite of the individual specification test statuses. Using various product search options, users can easily determine which OPC products have been fully or partially tested, previously tested against older criteria, recently workshopped, or have never been tested at all.

Another useful status is the 'Similar Product Tested' category, which is intended for OPC products that have been built on a common core framework. Since a single framework may represent hundreds of different OPC servers, it would be impractical for vendors to individually certify each OPC server with each new testing tool release or workshop event.

In addition to improving the OPC Foundation website, the Compliance Committee has replaced the existing 'OPC Compliance Tested' logo with two new, revamped logos. The new branding will differentiate between OPC products that have been self-tested by vendors using the OPC Foundation-supplied test tools, and those that have been certified by independent third-party

testing facilities. This is another important step towards improving the visibility and identification of certified OPC products.

Quartermaster's Stores

The OPC Foundation has several applications in their testing arsenal. Since OPC products are client-server based, and may support multiple OPC specifications, different testing tools and approaches are needed. For OPC Servers, the OPC Foundation provides a standard software application called the Compliance Test Tool (CTT), which supports the various OPC specifications. Members can download the CTT from the Foundation website and run the tests at their site. The tool generates an encrypted file which is forwarded to OPC Foundation, who then publishes the results on the OPC Product Certification section of the website.

Testing OPC clients is more challenging, since many client applications require only a subset of the full functionality provided by an OPC server. There can also be tremendous variation in how an OPC client may be incorporated into other software applications. The OPC Foundation meets this challenge by offering interoperability testing. This is a process where members attend an annual event and test the OPC client applications against the OPC servers supplied by other members. These events are called interoperability workshops and occur each year in Europe, North America and Japan. The interoperability test process requires that OPC vendors run a series of standard tests for each combination of an OPC client and an OPC server product. The results of these tests are collected and displayed on the OPC Foundation website as part of the overall Certification Test Status.

In spite of the variations of OPC clients available, there is a core set of interfaces and functionality that users have come to expect from all clients to improve interoperability. To ensure these tests are covered by the interoperability workshops, the OPC Foundation has recently developed a standardized OPC client test application called the OPC Analyzer. The tool not only logs all interaction between the OPC client and server, it also has a scripting capability that allows testers to generate error conditions or unexpected behavior in order to test the robustness of the OPC clients. This tool, along with network interrupt testing, allows vendors to determine how their products behave in simulated real world scenarios.

The Big Guns

In addition to these activities the OPC Foundation is currently in the process of 'rolling out their big guns' in the form of independent testing labs. This will further assist member companies with interoperability and will provide end users with a known set of tested interoperability criteria for any given OPC product. The aim of the test labs will be to provide testing beyond basic interface compatibility. The tests would include features such as a fixed reproducible testing environment, functional tests for both servers and clients, behavior tests for normal and exceptional operating scenarios, performance tests for long term and loading, unreliable operating environment and failure recovery testing, as well as usability, installation and configuration testing. This is an important major improvement in the overall OPC certification process that end users will significantly benefit from in terms of truly seamless interoperability.

Rallying the Troops

When Tom Burke, President and Executive Director of the OPC Foundation was asked about the response from the OPC community to the rallying cry for interoperability, he had this to say: *"The commitment from the vendors and end users alike has been clearly demonstrated through the volunteer effort developing the specifications and process to truly guarantee and improve multi-vendor interoperability achieving the highest level of quality."* Tom went on to say that *"The message from the end users and the reason for the OPC Foundation Enhanced Certification*

Program is to provide a solid foundation for certifying products to meet and exceed the end-user expectations with respect to the OPC Foundation technology deployment."

Lock and Load

The plan is firmly in place and deployment is underway, but achieving the mission for interoperability will be a series of actions on multiple fronts, at different times. Not only does the Enhanced Certification Program aim to greatly improve the quality of existing OPC products, it must also ensure the interoperability of products developed on the new OPC UA specifications. The scope of OPC UA products extends throughout the enterprise, and will present even more interoperability challenges. Significant resources from the OPC Foundation member companies have been committed, and the necessary processes, specifications and tools that will serve as the foundation for certifying all OPC products, including OPC UA, are being developed. The inevitable outcome of the OPC Foundation Enhanced Certification Program is the establishment of a testing methodology that ensures secure, reliable and interoperable high-quality OPC solutions for the end-user community, now and in the future.

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