



DGI Update: Your Guide to Interoperability & Conformance Test Services

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Commentary: It's All About the Math

There is an ongoing debate in the testing world on the accuracy of conformance testing versus full matrix interoperability testing. There is a common acceptance and verified history in the trusted use of conformance engines to test software and hardware. Full matrix interoperability testing (where every product tests against other products) is a new way of testing and is a paradigm shift for most. Drummond Group has claimed for some 10 years that the accuracy of full matrix interoperability testing is the same as testing against a conformance engine. This article discusses our recent mathematical proof of this claim. We now have proof.

Most software is developed through a quality assurance process that executes testing against a single conformance engine. This historic iterative testing practice was the subject of much conflict when Drummond Group first began full matrix interoperability testing. I can remember several disgruntled software companies asking "Why do we have to test with the other companies? Why can't you just build a reference platform and have us test against that?"

Conformance engines are typically built with error testing and negative testing to make the software even better. The more detailed the conformance engine the more exacting the software is the mantra. Conformance engines are the most typical and historic way that hardware and software is tested. There is an expense, sometimes significant, to build and maintain them.

With Internet commerce and especially B2B, communication is machine to machine. There is little to no human intervention. B2B communication is typically made up of layer upon layer of various standards that support one standard. A conformance engine would

have to include testing for each "layer" of the standard in order to ensure common interpretations amongst a group. For example, the layers for the AS2 standard may include: operating system, framework (Java or .Net), toolkits, reconciling the many certificates, and the http protocol, to name just a few. And, to add to the complexity, each layer has options which often contradict each other. This contradiction of options between layers, for example, is the major obstacle for web services today. But, building a conformance engine with all these layers for the one standard still will not get you to interoperability.

With the Internet, you have an exponential possibility of interfaces with other hardware platforms, software, networks, security, etc. The variety makes it complex and the complexity increases the cry for interoperability and the related costs. How will we get this to work together? The software product that has been internally tested against a single conformance engine is often not "working" in this environment. The cost for interoperability problems in B2B Internet Commerce has been guesstimated in the millions of dollars.

The paradigm shift from working only with conformance engines to working with full matrix interoperability testing is very difficult for some software and hardware companies. It is a trust factor. We often find that most industry groups, under the guidance of software companies, consider the use of conformance engines first rather than develop full matrix interoperability. It is typical that people want their computers to do the bulk of the work for them. And conformance engines will do this. Full matrix testing adds the complexity of getting a group of software vendors together to test and timing is often important to their product roll-outs. Conformance will get you on the road to interoperability but rarely does it complete it. Most software and hardware engineers can not believe that full matrix interoperable testing gives you conformant software and interoperability. If you are not testing against an engine, how can you really know the software is conformant? And surely, if all software is conformant to the engine, then interoperability occurs? Or does it?

Drummond Group has believed strongly for almost ten years that a full matrix interoperability test done with the correct procedures, over the appropriate test plan engenders conformant or near conformant products. What is interesting over the last few of months is that Drummond Group believes it has mathematically proven this. The group of proofs and definitions is many pages long, but if you want the complete theorem, please send us an email at info@drummondgroup.com.

Our findings state that a conformance Test Engine is no more conformant than, or just as conformant as, the products from a full matrix interoperability test, when the conformance engine is verified against the same number of products as it was in the interoperability test. The accuracy is the same.

This is significant in that most conformance testing is assumed to be more correct than interoperability with respect to conformance. This theorem says it is not, because the only way to verify a conformance engine is conformant is to test it against implementations or other conformance engines with the latter almost never happening because it is too costly.

The challenge in utilizing the conformance engine only for interoperability approach is the number of underlying standards that need to be added to fully test the standard. In Internet standards, over 50% of those "layers" have nothing to do with the primary standard being tested. And, as we've stated, gathering a common interpretation to build the engine is the next challenge. It is a complex undertaking with many variables.

Drummond Group continues to utilize both conformance engines and full matrix interoperability testing in its work. Conformance engines are great tools to use towards the end game of interoperability. Full matrix testing gets you even closer to interoperability. The balance is in the related costs of deployment, the number of layers in the standard, and the needs of the industry being served.