

Final Report

ebMS Interoperability Test

Second Quarter 2011 (2Q11)



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Cover Letter

DRUMMOND GROUP INC. is pleased to announce that the following participants in the Drummond Certified™ ebXML Message Service Interoperability Test 2Q11 (ebMS-2Q11) have completed all requirements and passed all required tests (see Final Test Results) between each product demonstrating interoperability and conformance to a Basic Profile subset of the ebMS version 2.0 specification. The Certification Run was performed July 15-26, 2011.

All participants engaged in and successfully completed the following additional optional tests of Technical Profiles which comprise compliant supersets of the ebMS v2.0 standard based on recommendations from industry specific sources:

- Profile for XML Encryption and SSL Client Authentication as described by the Centers for Disease Control and Prevention (CDC)

Five of the six participants engaged in and successfully completed the following additional optional tests of Technical Profiles which comprise compliant supersets of the ebMS v2.0 standard based on recommendations from industry specific sources:

- Automotive Retail Profile for GZIP based Compression as described by Standards for Technology in Automotive Retail (STAR)

To fully understand what completing the test means in the use of the products in production, please read this document carefully.

Sincerely,

Timothy Bennett
Standards Certification
Drummond Group Inc.

Disclaimer

Drummond Group Inc. (DGI) conducts interoperability and conformance testing in a neutral test environment for various companies and organizations ("Participant"). At the end of the testing process, DGI may list the name of the Participant in the final test report along with an indication that the Participant passed the test. The fact that the name of the Participant appears in the final report is not an endorsement of the Participant or its products or services, and DGI therefore makes no warranties, either express or implied, regarding any facet of the business conducted by the Participant or their product.

Test Participants

 <p>Axway</p> <p>http://www.axway.com</p> <p>Product Name: Axway B2Bi 1.5 / Axway Interchange 5.10 / Axway Activator 5.10</p>	 <p>Cleo Communications</p> <p>http://www.cleo.com</p> <p>Product Name: VersaLex™ v4.3 tested in VLTrader™ v4.3</p>
 <p>GXS</p> <p>http://www.gxs.com/</p> <p>Product Name: BizManager 3.3</p>	 <p>IBM</p> <p>http://www.ibm.com</p> <p>Product Name: IBM WebSphere Partner Gateway v6.2.1</p>
 <p>IBM</p> <p>http://www.ibm.com</p> <p>Product Name: IBM Sterling B2B Integrator v5.2 with Standards Library v8.0</p>	 <p>IBM</p> <p>http://www.ibm.com</p> <p>Product Name: IBM WebSphere DataPower B2B Appliance XB60/XB62 v4.0.2</p>

Definitions

Interoperability -- A product is deemed interoperable with all other products in the Interoperability Test Round if and only if it demonstrates in a full-matrix manner the pair wise exchange of data covering the *Test Criteria* between all products in the Interoperability Test Round. A product is either totally interoperable or it is not interoperable. Waivers or exceptions are not given in demonstrating interoperability for the *Test Criteria* unless the entire *Product Test Group* and DGI agree.

Interoperable products – is that group of products, from the *Product Test Group*, which successfully completed the *Test Criteria*, in a full duplex manner with every other *Product Test Group* participant in an Interoperability Test Round without any errors in the final test Phase. Interoperable products receive a Drummond Certified™ Seal.

Product Test Group – A group of products involved in an interoperability or conformant Test Round.

Product, product-with-version, or product-with-version-with-release – are interchangeable and are defined for the purpose of a Test Round as a product name, followed by a product version, followed by a single digit release. The assumption is that version and release syntax is as: “VV.Rx...x,” where VV is the version numeral designator, R is the single digit release numeral designator and x is the sub-release multiple digit numeral designator. DGI assumes that any digits of less significance than the R place do not indicate code changes on the product-with-version-with-release tested in the Test Round. A vendor must list a product as product name, followed by version digits followed by a decimal point followed by a single release designator digit before the Test Round is complete.

Test case – The test criteria is a set of individual test cases, often 10 to 50 which the product test group exchange among themselves to verify conformance and interoperability.

Test Criteria – A set of individual tests, based on one or more standard specifications, that is used to verify that a product is conformant to the specification(s) or that a set of Product-with-version's are interoperable under the *Test Criteria*.

Interoperability Test Summary

ebMS v2.0 is a Message Service protocol for reliable Business-to-Business data interchange. ebMS v2.0 adds quality of service features on top of transfer protocols such as HTTP and SMTP. Key qualities of service features include guaranteed delivery and non-repudiation of receipt. ebMS v2.0 can reliably transfer any data type including XML, X12, EDIFACT, or binary data between two parties over the Internet. The purpose of this test is to provide software vendors a neutral venue to test interoperability of ebMS v2.0 products in a non-competitive environment with the goal to accelerate adoption of high quality ebMS v2.0 deployments.

This is the eleventh round of DGI Interoperability testing of the OASIS ebXML Message Service specification version 2.0 (ebMS v2.0). The test was performed from June to July 2011.

During the eleventh round of ebMS testing (2Q11), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round. Six participants successfully tested over the Basic Profile, six participants executed the additional Industry/Technology profile for:

XML Encryption and SSL Client Authentication, and

five participants executed the additional Industry/Technology profile for:

Automotive Retail with GZIP based data compression of payloads

Interoperability Test History

ebMS 2Q10 Interoperability Test June - July 2010

During the tenth round of ebMS testing (2Q10), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round. Four participants successfully tested over the Basic Profile, and four participants executed the additional Industry/Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads

ebMS 3Q09 Interoperability Test July - August 2009

During the ninth round of ebMS testing (3Q09), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round. Four participants successfully tested over the Basic Profile, and four participants executed the additional Industry/Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads

ebMS 4Q08 Interoperability Test October - November 2008

During the eighth round of ebMS testing (4Q08), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round. Four participants successfully tested over the Basic Profile, and four participants executed the additional Industry/Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads

For the eighth round of ebMS testing, the optional tests in the seventh round (4Q07) for interoperability using the DSAwithSHA1 digital signature algorithm over both an HTTP and HTTPS connection were included as part of the required Basic Profile series of tests.

ebMS 4Q07 Interoperability Test October - December 2007

During the seventh round of ebMS testing (4Q07), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test

round. Six participants successfully tested over the Basic Profile, and five participants executed the additional Industry -Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads

For the seventh round of ebMS testing, a couple of new optional tests were defined in order to test interoperability using the DSAwithSHA1 digital signature algorithm over both an HTTP and HTTPS connection. Five participants successfully executed the DSA tests.

ebMS 4Q06 Interoperability Test October - December 2006

During the sixth round of ebMS testing (4Q06), DGI maintained the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round. Six participants successfully tested over the Basic Profile, and five participants executed the additional Industry -Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads

ebMS 3Q05 Interoperability Test September - December 2005

During the fifth round of ebMS testing (3Q05), DGI introduced the “In the Queue” process to ebMS testing rounds where new participants tested for compliance against reference platforms before joining the full interoperability test round.

ebMS 3Q04 Interoperability Test September - December 2004

During the fourth round of ebMS testing (3Q04), all participants successfully tested over the Basic Profile and several participants tested additional Industry/Technology profiles for:

XML Encryption and SSL Client Authentication
Automotive Retail with GZIP based data compression of payloads
HL7 version 2 and version 3 payload support

ebMS 3Q03 Interoperability Test September - December 2003

During the third round (3Q03), DGI defined an approach to accelerate multiple industry interoperability. A Basic Profile was defined to include all required ebMS v2.0 features plus several optional features including reliable messaging, ping/pong and message status and industry requested features were tested as separate profiles. Six participants successfully tested over a profile for XML Encryption & SSL Client Authentication where details prescribed the CDC.

ebMS 3Q02 Interoperability Test August - December 2002

In the second round (3Q02) error testing was expanded and all participants tested directly with the Centers for Disease Control's implementation of ebMS. Two participants executed optional testing of XML Encryption & SSL Client Authentication.

ebMS 4Q01 Interoperability Test September - December 2001

The first round (4Q01) covered all ebMS v2.0 required features including message packaging with additional testing of reliable messaging features, multiple attachments, SSL, SMIME encryption, informal testing of error scenarios. Test Case Summary

Test Summary: Basic Profile

The following tests were identified as representative of the overall Basic Profile test suite and are composed of the most complex features. These tests comprise the ebMS v2.0 Dry Run/Final Run Test Suite and were executed as the Final Test.

Test	Description	Transfer	Sync/Async	Payload
E1	Unsigned with Ack	http	async	Small XML
E3	Signed Data/Unsigned Ack	http	async	Small XML
E4	Signed Data/ Signed Ack Sync	http	sync	Small XML
E5	Signed Data/Signed Ack SSL	https	async	Small XML
E6	DSA Signed Data/Unsigned Ack	http	async	Small XML
F3	Two Payloads Signed Data	http	sync	Small XML Medium binary jpeg
F4	Five Payloads Signed Data/Ack SSL	https	async	Medium X12 HCCO Small EDIFACT Small XML Large XML Medium binary jpeg
G1	Ping Pong	http	sync	none
H1	Once and only once	https	async	Small XML
H2	Duplicate Detection	https	async	Small XML
I2	Value Not Recognized	http	sync	Small XML
I3	Not Supported	http	sync	Small XML
I4	Inconsistent sync	http	async	Small XML
I5	Security Failure	http	sync	Small XML
I6	Time to Live expired	http	sync	Small XML
I7	Message header format	http	sync	Small XML
I8	Missing Payload	http	sync	Small XML
I9	Delivery Failure	http	async	Small XML

Interoperability is determined by each product-with-version successfully sending and receiving each test case with the others. A test case is successful when the expected result is achieved according to the message specifications.

On July 15-26, 2011, all products-with-version listed on this test report successfully sent and received test cases E1, E3, E4, E5, E6, F3, F4, G1, H1 and H2 with each and every other participant. Test case C1 (Large Message) was successfully sent and received between each participant over the course of the Debug Phase and was not repeated for the Certification Run. The I2-I9 tests were successfully executed between each participant and the DGI hosted test server.

It should also be noted that no warranty of product interoperability is implied over and above the publishing of the results of the Test Round as completed by all vendors during the specified time period of testing.

Large Messages

The C1 Large Message Test is included in the Basic Profile as a straightforward test of a product-with-version's ability to send, receive and process large messages (50 megabyte). The test is not intended as a stress test or as a performance test. DGI does not require a full matrix test for Large Messages to avoid performance problems related to memory issues, as participant test servers are typically medium sized servers. However, during the entire Interoperability Test Event, each participant exchanges a large message with every other participant. Since the Test Group consisted of six (6) participants, each of the Test Participants successfully exchanged Large Messages during the Debug Phase. Since all participants had successfully exchanged large messages in full-matrix fashion during the Debug Phase, no Large Messages were exchanged during the Certification Run.

DSA Signature Algorithms

The ebMS 2 specification recommends the use of the DSAwithSHA1 algorithm for digitally signing ebMS messages. Historically this ebMS certification event has used the RSAwithSHA1 algorithm because of its widespread use in the marketplace. However, since the ebMS specification does recommend the use of DSA, this certification event now offers required tests as part of the Basic Profile Test Suite to certify the interoperability of the use of DSAwithSHA1 digital signatures over both HTTP and HTTPS. Test cases (E6 and E7) for messages signed with the DSAwithSHA1 signature algorithm using DSA digital certificates over both HTTP and HTTPS were executed by all participants during the Debug Phase. For the Certification Run, only the DSA-signed message over HTTP (E6) test was repeated.

Error Testing

Error tests defined in the Basic Profile are not tested in a round-robin fashion. Messages-in-error are from a DGI hosted test server and sent to participants.

During the Debug Phase and the Certification Run, a full range of tests designed to test the error handling of each participant's Product-Under-Test were repeated with each participant. The executed Error Tests are listed in Debug Phase Basic Profile Test Suite.

Test Summary: XML Encryption with SSL Client Authentication Profile

The following participants successfully completed the XML Encryption with SSL Client Authentication Industry Optional Profile Tests: **Axway**, **Cleo Communications**, **GXS/Inovis**, **IBM/WebSphere**, **IBM/Sterling**, and **IBM/DataPower**.

As the ebMS 2.0 specification does not provide detailed requirements or recommendations for the use of XML Encryption, this profile makes use of CDC experience and recommendations for the use of XML Encryption with ebMS.

Beginning with the 4Q08 Interoperability Test Round, the message payload used during these tests was changed from the one used in previous test rounds. The new payload consisted of a small XML file in which some of the data consisted of accented non-English characters. This change was in response to reports of interoperability issues in the field with respect to payloads of this sort with XML encryption of at least one security toolkit vendor.

The following tests were executed by each participant noted above. Each participant successfully executed each test against the other participants involved in this optional test.

Test	Description	Transfer	Sync/Async	Payload
J1	Client Authentication	https	sync	Small XML w/accented characters
J2	Client Authentication & XML Encryption	https	sync	Small XML w/accented characters
J3	Client Authentication, Digital Signature & XML Encryption	https	sync	Small XML w/accented characters

For the Certification Run, only the J2 and J3 tests were executed by the participants that opted in for the XML Encryption optional profile testing.

Test Summary: Automotive Retail Profile - GZIP Based Compression

The following participants successfully completed the Automotive Retail with GZIP based Compression Industry Optional Profile Tests: **Axway, Cleo Communications, GXS/Inovis, IBM/WebSphere, and IBM/Sterling.**

As the ebMS 2.0 specification does not provide detailed requirements or recommendations for the use of payload compression, this profile makes use of the STAR (Standards for Technology in Automotive Retail) Profile experience with ebMS.

The following tests were executed by each participant noted above. Each participant successfully executed each test against the other participants involved in this optional test.

Test	Description	Transfer	Sync / Async	Payload
K1	XML Payload Synchronous	https	sync	Small XML, PartsOrder BOD
K2	XML Payload Asynchronous, Compressed	https	async	Large XML, PartsInvoice BOD
K3	XML Payload Asynchronous, Compressed and Signed	https	async	Large XML, PartsInvoice BOD

For the Certification Run, only the K2 and K3 tests were executed by the participants that opted in for the Automotive Retail optional profile testing.

Interoperability Issues

During previous ebMS interoperability rounds, issues arose that required consensus to achieve interoperability. Some of these items are outside the scope of the ebMS v2.0 and are related to underlying technical specifications such as MIME, and some of these issues address ebMS v2.0 features which have been interpreted differently by different readers.

The consensus items from all ebMS Interop Test Rounds are documented at <http://www.drummondgroup.com/html-v2/KL/> including any new items identified during the ebMS 2Q11 Test Round.

Test Requirements

In order to be part of the certified interoperable products-with-versions, each participant must both successfully send and receive all tests cases in the Basic Profile with each and every other participant.

Trading Partner Requirements

All participants were required to establish trading partner relationships with each other. All participants were remote from each other, and all test messages were exchanged over the public Internet. Participants were responsible for distributing their network information and configuring their firewalls to allow all other participants access to their product-with-version.

Each participant provided their security certificates (including SSL server and client certificates) to the other participants for storage in their trusted store. Each certificate conformed to the X.509 standards but varied with respect to the fields used in the certificates. All participants generated their own self-signed certificates. Some participants chose to use a single certificate for all purposes, including SSL Server Authentication, SSL Client Authentication, Digital Signature and XML Encryption.

Additionally, all participants generated a second set of DSA certificates for use with the E6 and E7 tests.

DGI provided test payloads and user identification aliases.

Technical Requirements – Basic Profile

Each participant successfully sent and received all tests cases in the Basic Profile with each and every other participant, with the exception of the Error Tests which are executed between a participant and a DGI hosted test server.

The Basic Profile test cases cover the core requirements of ebMS v2.0 and include some optional features of ebMS v2.0 that are widely implemented and or desired by end users. These requirements are described directly below.

The effect is that all the products-with-version are proven interoperable over a feature-rich, industry horizontal profile and demonstrates that the products-with-version can cover the technical requirements listed below. For additional technical information regarding ebMS v2.0 requirements, please see the Message Service Specification version 2.0 located at:

http://www.oasis-open.org/committees/ebxml-msg/documents/ebMS_v2_0.pdf

Message Packaging

ebMS leverages SOAP with Attachments (SwA) to define an extensible message package that prescribes message headers for routing, partner identification, message identification, timestamping, digital signature and other quality of service features. The message package is also capable of encapsulating one or

more business documents or other binary data as payloads. Participant products-with-version must be capable of formatting SwA messages in the manner described by the specification.

Digital Signature

ebMS v2.0 leverages XMLDigitalSignature to provide proof of content-integrity, authentication of senders and receivers and NonRepudiation. An ebMS v2.0 signature is a signature over the entire message which may include one or more payloads. For the Basic Profile, the RSAwithSHA1 and DSAwithSHA1 digital signing algorithms are used.

Error Handling

ebMS v2.0 leverages SOAP Fault semantics for low level SOAP-related errors, and specifies higher level “ebMS error lists” that can be comprised of a list of warnings and or errors that occur at the ebMS transport level. For example, a SOAP syntax error will generally result in a SOAP Fault error reply, while a message where TimeToLive has expired will result in an ebMS defined error list reply stating that the message has expired.

Synchronous and Asynchronous messaging

ebMS supports both synchronous and asynchronous message patterns. The type of message pattern is defined per message. This allows ebMS to be highly transfer protocol neutral and to be used in business scenarios where immediate reply is required and in business scenarios where delayed replies are common due to queuing operations, load balancing, system outages or other technical or business reasons.

Synchronous and Asynchronous Acknowledgments of Receipt

Acknowledgments validate the receipt and persistent storage of a message. Synchronous acknowledgments provide a confirmation of receipt in a message returned over the same session and the same transfer protocol as the original message. Asynchronous acknowledgments are sent back to the originator over a separate session.

Acknowledgments are tested in both synchronous and asynchronous styles, both signed and unsigned. A signed Acknowledgment includes hash digests of the original message allowing for true Non Repudiation of Receipt.

Transfer Protocols

Both HTTP & HTTP/s transports were tested. SMTP was not tested.

Payloads

The ebMS v2.0 message package provides for multiple payloads. Effectively, more than one business document can be sent in a single message. In some cases, the secondary documents may be binary files such as pictures and are often referred to as attachments; conceptually similar to email attachments.

Tests of single and multiple (up to five) payloads were executed, and these tests included Digital Signature and HTTP/S transport.

These payloads were used throughout the testing:

- Medium sized HIPAA compliant X12 document appx. 18k provided by HCCO
- Small EDIFACT EDI document appx. 2k
- Small XML document appx. 600 bytes
- Large XML document appx. 41k
- Medium sized XML automotive PartsOrder BOD appx. 4k
- Large XML automotive PartsInvoice BOD appx. 1meg
- Very large X12 EDI file 50 megabytes
- Medium sized binary jpeg file apx. 11k

Large Messages

ebMS v2.0 provides the ability to transport any data type including large files. As a message service standard gains wider deployment in the market, invariably end users demand the ability to send very large messages. One test was run with a 50 megabyte EDI payload. This test is intended to prove the ability to send and receive large messages, and is not intended as a performance or stress test. Due to the Test Group comprising six (6) participants, the large message tests were successfully executed in a full matrix manner during the Debug Phase of the test.

Reliable Messaging

ebMS v2.0 defines features to enable once-and-only-once delivery of messages. This is often referred to as Guaranteed Delivery; a message is received and persisted to storage successfully or the sender is notified of failure.

Tests are executed that exercise the features needed for once-and-only-once:

- Acknowledgment of receipt
- Senders ability to retry failed messages

Message Status

This ebMS v2.0 specific service is used to query the status of a previously sent message. An ebMS v2.0 specific reply is generated listing the previous message as Unauthorized, NotRecognized, Received, Processed or Forwarded.

Ping/Pong

The Ping/Pong feature of ebMS v2.0 can be used as a “keep alive” status message, allowing parties to query the state of a partner’s message handler for management and troubleshooting purposes. Ping/Pong can also be useful as a simple connectivity test when engaging with new partners.

Error Handling

Each participant was sent messages-in-error from a DGI hosted test system. The replies from the products-with-version were analyzed to determine if the participant system recognized the error and responded with an appropriate error response.

Technical Requirements - XML Encryption & SSL Client Authentication Profile

Participants successfully executed an optional suite of tests designed to prove interoperability of XML Encryption and SSL Client Authentication implementations. These tests were executed in a matrix, all participants choosing to opt-in tested as both sender and receiver with the other participant. All six of the participants opted in on the XML Encryption Optional Profile Test. The specific details for applying XML Encryption to ebMS v2.0 payloads originated from the CDC. For more information regarding the relationship between CDC PHIN and ebMS v2.0 see:

<http://www.cdc.gov/phn/messaging/index.htm>

<http://www.cdc.gov/phn/components>

Client Authentication

Client Authentication is an option of SSL/TLS that allows a Server to authenticate a Client via the Client’s possession of a recognizable Digital Certificate. Marketplace deployment of Client Authentication is growing, as organizations realize its potential as a useful part of a business to business security strategy. Participants proved interoperability over SSL Client Authentication and used it for all tests within this Profile.

XML Encryption

ebMS v2.0 allows for the use of a persistent encryption mechanism that can be applied to payloads within a message. Persistent encryption can be leveraged as an additional layer of security for Internet based messaging; essentially part or all of a message payload may be encrypted in a manner that allows only the intended Receiver to decrypt the message. At the time the ebMS v2.0 standard was approved, XML Encryption was still a draft standard. As a result, ebMS v2.0 states that XML Encryption is the preferred encryption method, but ebMS v2.0 does not provide detailed methods for applying XML Encryption to ebMS messages.

This profile requires encryption of whole XML payloads using XML Encryption, Participants who executed this Profile successfully interoperated with XML Encryption and also a combination of XML Encryption with DigitalSignature.

Technical Requirements – Automotive Retail Profile for GZIP-based Compression

Five of the six participants chose to opt-in on the optional Automotive Retail Profile and successfully executed a suite of tests designed to prove interoperability of key features recommended by the Standards for Technology in Automotive Retail (STAR) consortium's ebMS Implementation Guidelines.

For additional technical information regarding the relationship between STAR and ebMS, refer to the STAR documents named Transport Guidelines and ebMS Implementation Guidelines which can be obtained from the Special Interest Groups / Infrastructure section of the public STAR website after completing a free registration. See <http://www.starstandards.org>.

GZIP Based Compression

The use of large messages (multiple megabytes) is common in many industries. There are several available methods for compressing HTTP based messages. The STAR guidelines recommend the use of gzip based compression where the payload itself is composed of compressed data using the MIME type application/gzip.

Participants proved interoperability over gzip based compression including the ability to combine compression with digital signature. For tests that required signature, the order of operations were implemented as compress-then-sign for message senders and validate-signature-then-decompress for receivers.

Industry recommended common header field values

To assist in interoperability, the STAR guidelines require common methods for populating some of the key ebMS message header fields. Participants proved interoperability over requirements to populate the Service, Action and Timestamp header fields in accordance with STAR guidelines. Service and Action field values were based on the type of STAR OAG BOD payload in the test message.

Debug Phase Basic Profile Test Suite

A1	Connectivity			Individual Setup Time
B1	Simple Transfer	http	async	Small XML
B2	Simple Transfer SSL	https	async	Small XML
C1	Large Message	http	async	Very Large X12
D1	Signed Data	http	async	Small XML
E1	Unsigned with Ack	http	async	Small XML
E2	Unsigned with ACK sync	http	sync	Small XML
E3	Signed Data/Unsigned Ack	http	async	Small XML
E4	Signed Data/ Signed Ack Sync	http	sync	Small XML
E5	Signed Data/Signed Ack SSL	https	async	Small XML
E6	DSA Signed Data/Unsigned Ack	http	async	Small XML
E7	DSA Signed Data/Signed Ack	https	async	Small XML
F1	2 Payloads	http	async	Small XML Medium binary jpeg
F2	5 Payloads	http	async	Medium X12 HCCO HIPPA Small EDIFACT Small XML Large XML Medium binary jpeg
F3	2 Payloads Signed Data	http	sync	Small EDIFACT Medium binary jpeg
F4	5 Payloads Signed Data/Ack SSL	https	async	Medium X12 HCCO HIPPA Small EDIFACT Small XML Large XML Medium binary jpeg
G1	Ping Pong	http	sync	None
G2	Ping Pong SSL	https	async	None
G3	Message Status SSL	https	Async	None
H1	Once and only once	https	Async	Small XML
H2	Duplicate Detection	https	Async	Small XML Medium binary jpeg
I1	SOAP Fault	http	sync	Small XML
I2	Value not recognized	http	sync	Small XML
I3	Not Supported	http	sync	Small XML
I4	Inconsistent sync	http	async	Small XML
I5	Security Failure	http	sync	Small XML
I6	Time to Live expired	http	sync	Small XML
I7	Message Header format	http	sync	Small XML
I8	Missing Payload	http	sync	none
I9	Delivery Failure	http	async	Small XML

During the Debug Phase, every participant executed each Basic Profile test against each and every other participant, acting as both receiver and sender.

The only exceptions to this matrix style testing were for the Error Tests where Error Test I9 was executed from the participant to a DGI hosted server and Error Tests I1 through I8 were executed from a DGI hosted server to the participant's server.

Overview of the Interoperability Compliance Process®

Interoperability of B2B products for the Internet is essential for the long-term acceptance and growth of electronic commerce. To foster interoperability, DGI facilitates interoperability and conformance tests. This section contains a description of the test process involved with creating and listing interoperable products.

DGI In-the-Queue Test Round

In-the-Queue Test Rounds are designed to allow participants—with products new to DGI interoperability testing, or previously certified products that have made significant product changes or undergone version changes, or missed the most recent test round—to both test and debug their products with the DGI Test Server.

The DGI Test Server is a collection of products-with-version from the previous Interoperability Test Round. These products were provided by the vendors on a voluntary basis. The DGI Test Server allows products new to the interoperability process to be debugged in a quicker manner by testing with proven products-with-version.

Through the In-the-Queue Test Rounds, participants will see their products-with-version become conformant to the ebMS v2.0 standard and interoperable with the DGI Test Server products. Products which successfully complete In the Queue Test Rounds are considered compliant to the respective standard and will be listed on the www.drummondgroup.com website as "In the Queue," but they will not be given product Interoperability Status on the www.drummondgroup.com website.

Successful test completion also qualifies that particular product to participate in the next DGI Interoperability Test round, but does NOT guarantee successful completion of the full Interoperability Test Round. DGI makes no warranties or guarantees that products passing In the Queue Test Rounds will pass the Interoperability Tests.

DGI Interoperability Test Round

Products-with-version from the previous ebMS v2.0 Interoperability Test Round and products-with-version from the In-the-Queue tests come together in a vendor-neutral and non-competitive environment to test with each other in order to become interoperable with each other. In an Interoperability Test Round, each product-with-version must successfully test with each other in order to be certified as interoperable.

The DGI Interoperability Test Round verifies conformance to a standard and then verifies that members of the Product Test Group are interoperable among themselves. Interoperability is an all or nothing within the Product Test Group over the Test Criteria. A product is either interoperable with all other products in the Test Group or not.

Products-with-version which demonstrate complete interoperability among the passing members of the Product Test Group are given a Drummond Certified™ Seal and are listed with Interoperability Status on the www.drummondgroup.com website. Interoperability Test Rounds are periodically repeated to verify that as product names, versions or releases change, the products remain interoperable.

About Drummond Group Inc.

[Drummond Group Inc.](#) (DGI) is the trusted interoperability [test lab](#) offering global testing services through the product life cycle. Auditing, QA, conformance testing, custom software test lab services, and [consulting](#) are offered in addition to interoperability testing. Founded in 1999, DGI has tested over a thousand international software products used in vertical industries such as automotive, consumer product goods, healthcare, energy, financial services, government, petroleum, pharmaceutical and retail. For more information, please visit www.drummondgroup.com or email: info2@drummondgroup.com