BPC Message Level Response Profile Version 1.0

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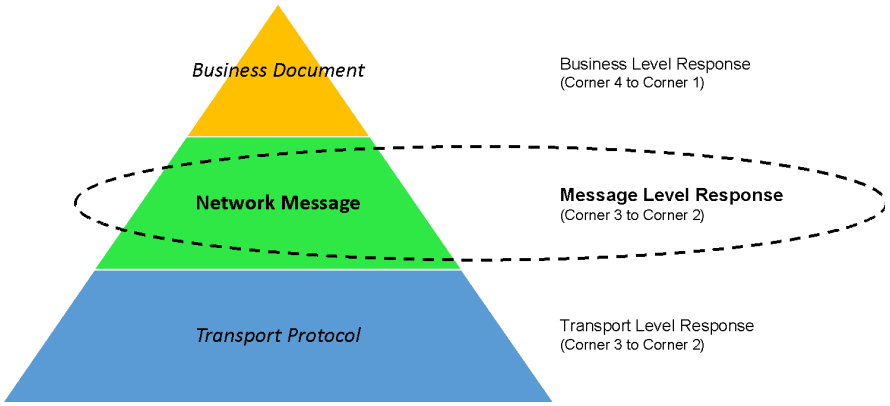
Business Payments Coalition

1 Table of Contents

2 Introduction

2.1 Scope

This document specifies the Message Level Response (MLR) document type used for signaling technical validation errors from a receiving Access Point (Corner 3) to a sending Access Point (Corner 2). The MLR is used when a Corner 3 Access Point receives a message from a Corner 2 Access Point that it is unable to process, and is the middle of three response layers defined in the BPC Exchange Framework:



Common uses of the MLR are:

- Reporting structural errors with a received Business Document or its containing envelope (i.e., XML schema validation errors in a received UBL or XHE instance),
- Reporting data integrity constraint violations in a received Business Document or its containing envelope (i.e., wrong data element cardinalities, code list violations, arithmetic errors, etc. in a received UBL or XHE instance),
- A received message is for an unknown or unrelated Corner 4.

Errors related to the transport or transmission of messages between Corners 2 and 3, such as transport policy violations (encryption, signature, compression, etc.), messages sent to the wrong Corner 3 Access Point, or from a Corner 2 Access Point not part of the BPC network, are specified in the BPC AS4 Profile specification and are outside of the scope of this document.

Errors and other responses from Corner 4 to Corner 1 related to the content of the Business Document, such as invoice acceptance and rejection, incorrect purchase order numbers, prices and products, etc., are specified in the respective document type profiles and are outside of the scope of this document.

2.2 Conformance

The keywords ‘MUST’, ‘MUST NOT’, ‘REQUIRED’, ‘SHALL’, ‘SHALL NOT’, ‘SHOULD’, ‘SHOULD NOT’, ‘RECOMMENDED’, ‘MAY’, and ‘OPTIONAL’ in this specification are to be

interpreted as described in RFC2119 and RFC 8174 when, and only when, they appear in all capitals, as shown here.

2.3 Terms and Definitions

For the purpose of this specification, all terms shall have the definitions defined in section 2.3 of the E-invoice Exchange Framework – Approach to Managing a Federated Registry Services Model in a Four-Corner Network report found here: https://businesspaymentscoalition.org/wp-content/uploads/bpc-e-delivery-netwo rk-validation-exercise-2020.pdf

2.4 Normative status

This document is the sole normative specification of an MLR message in the BPC Exchange Framework. All Access Points implementing MLR messages MUST conform to this document.

All contents of this document, except for the provided examples, is normative, unless otherwise specified. All examples provided are non-normative, unless otherwise specified.

Any supporting artefacts developed in relation to this document are non-normative, unless explicitly referenced from this document as being normative. In case of discrepancies between this document and any supporting or related artefact, this document contains the normative information.

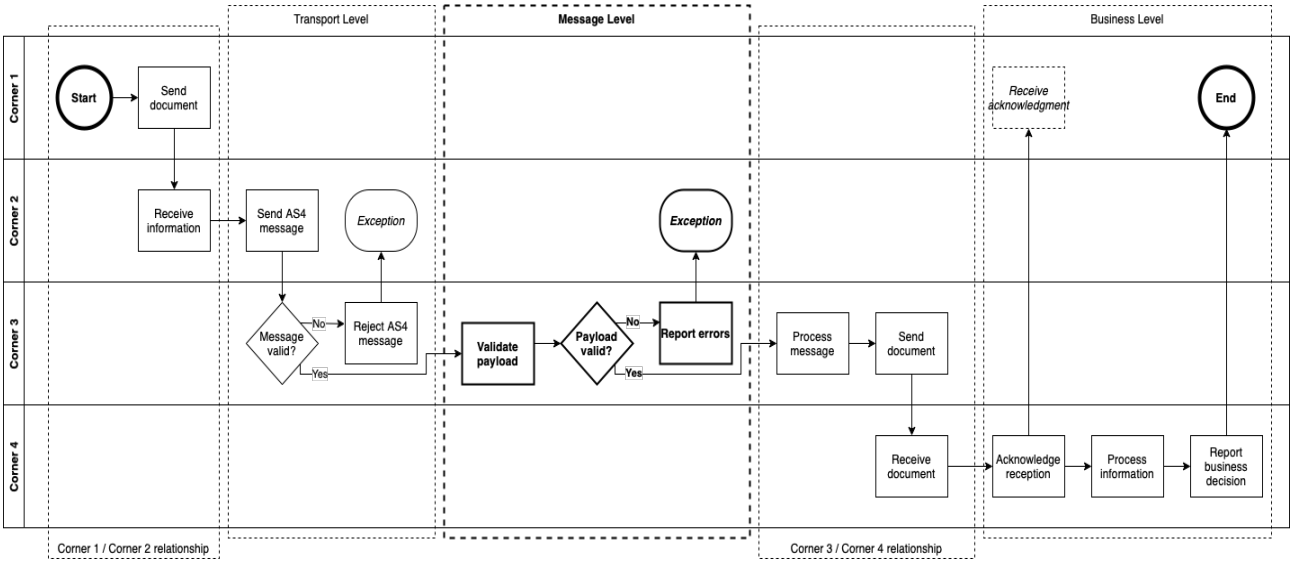
3 General Use

3.1 Choreography of the Message Level Response

The purpose of the BPC Exchange Framework is to allow a Corner 1 sender to relay business information to a Corner 4 receiver. In this process, the information is relayed from the Access Point of the sender (Corner 2) to the Access Point of the receiver (Corner 3), before finally being delivered to its final recipient (Corner 4). It is necessary for Corners 3 and 4 to be able to report errors and nonconformance back to Corners 1 and 2, which is achieved through the processes and response messages defined within the three response layers of the Exchange Framework:

- **Transport Level Response layer**: synchronous responses from Corner 3 to Corner 2 as defined by the AS4 transport profile, such as invalid Access Point credentials (invalid or revoked certificate), incorrect encryption or encryption algorithm, and other failures to conform with the transport profile of the Exchange Framework. The Transport Level Response layer is also used for nonrepudiation responses from Corner 3 to Corner 2 as defined in AS4.
- **Message Level Response layer**: asynchronous responses from Corner 3 to Corner 2 related to the technical structures and data integrity constraints of the message, such as syntax errors, data integrity constraint violations, and network errors not defined within the AS4 profile.
- **Business Level Response layer**: response messages specifically addressed by Corner 4 to Corner 1, such as acknowledging the reception of a document, and reporting a business decision such as accepting or disputing a document.

The Transport Level and Message Level response layers are technical layers used for communication between Corners 2 and 3, as illustrated in the following diagram:



As shown above, the sending of business documents also involves the exchange of

information between Corner 1 and Corner 2, and between Corner 3 and Corner 4. These exchanges are based on private agreements between the Corner 1 and Corner 4 entities and their respective Access Points and are not defined within the technical context of the BPC Exchange Framework.

3.2 Referencing the Message Level Response

3.2.1 Business Document Type Identifier

The following identifier has been created using the bdx-docid-qns scheme and in accordance with BPC Identifier Policy, and MUST be used when referencing this MLR profile:

```
urn:oasis:names:specification:ubl:schema:xsd:ApplicationResponse-
2::ApplicationResponse##bpc-1.0-messagelevelresponse
```

All implementations and uses of the MLR within the BPC Exchange Framework using the above identifier MUST be conformant with this document. All representations of the MLR identifier MUST be in accordance with the BPC Identifier Policy.

3.2.2 No Business Process Identifier

The MLR is a technical response message that can be used to respond to any message received through the BPC Exchange Framework and is therefore not part of any specific business process. Consequently, it does not specify a Business Process Identifier.

When referenced from an SMP service, the ServiceReference and ProcessMetadata elements referencing the MLR MUST NOT include any Process elements as in the following non-normative example:

```
  <sma:ServiceReference>
    <smb:ID schemeID="bdx-docid-
qns">urn:oasis:names:specification:ubl:schema:xsd:ApplicationResponse-
2::ApplicationResponse##bpc-1.0-messagelevelresponse</smb:ID>
  </sma:ServiceReference>
```

3.3 Containing Envelope

An MLR MUST be contained within a business document envelope as specified in the BPC XHE Profile specification.

The XHE FromParty MUST be set to the business identifier of the Access Point *sending* the MLR (i.e., the Access Point that has *received* the business document message), and the XHE ToParty MUST be set to the business identifier of Access Point *receiving* the MLR (i.e., the Access Point that has *sent* the business document message).

The XHE Payload/CustomizationID MUST be set to the MLR Business Document Type

identifier as specified in section 2.2.1 of this document. The XHE Payload/CustomizationID/@schemeID attribute MUST be set to `bdx-docid-qns`.

The MLR document MUST be contained within the XHE envelope and MUST NOT be an external reference. The first Payload element of the XHE envelope MUST contain the MLR document itself.

The XHE envelope of the MLR MUST NOT make use of XHE encryption.

3.4 Encoding

MLR messages MUST be UTF-8 encoded.

3.5 Service Level

If a receiving Access Point (Corner 3) finds message level errors in a received Business Document message that prevents it from relaying the Business Document to the intended recipient (Corner 4), the Access Point MUST send an MLR back to the sending Access Point (Corner 2) within 24 hours from receipt of the Business Document message.

A sending Access Point (Corner 2) that has not received an MLR within 24 hours from sending a Business Document MAY assume that no message level errors have been found and that the Business Document is being relayed to its intended recipient (Corner 4).

3.6 Error Handling

A Corner 2 Access Point receiving an MLR MUST NOT respond with a new MLR message. If an MLR is not understandable, the Corner 2 Access Point MUST contact the technical contact of the Corner 3 Access Point.

4 Data Model

4.1 Use of OASIS UBL 2.3

The BPC Exchange Framework's MLR message is a profile of the Application Response document type specified in the OASIS UBL 2.3 specification: https://docs.oasis-open.org/ubl/os-UBL-2.3/UBL-2.3.html

All MLR messages sent through the BPC Exchange Framework MUST conform to all conformance clauses in section 6.1 of the above specification.

4.2 Data model

The table below defines the normative data model for the MLR message. A sender MAY include additional elements and attributes; however, they MUST NOT require that a receiver be capable of understanding them.

Element or attribute	Cardinality	Definition and use
ApplicationResponse	1..1	Root element of the MLR.
└ UBLVersionID	1..1	The version of UBL being used. MUST be set to exactly `2.3`.
└ CustomizationID	1..1	The Business Document Type identifying the type and version of MLR being sent. MUST conform to section 2.2.1 of this document.
└ ID	1..1	An identifier assigned by the Sender Party for the MLR document. The combination of Sender Party and ID MUST be unique.
└ IssueDate	1..1	The date the MLR document was created. MUST be in ISO 8601 format.
└ IssueTime	1..1	The time of day the MLR document was created. MUST be presented in UTC time zone and MUST be in ISO 8601 format.
└ SenderParty	1..1	The Access Point *sending the MLR* (i.e., the Corner 3 Access Point who is responding to a received business document message).
└└ PartyIdentification	1..1	Identification of the Sender Party.
└└└ ID	1..1	The Business Identifier used to identify the Sender Party in the network, as specified in the BPC Identifier Policy.
└└└ ID/@schemeID	1..1	The identifier of the scheme used to issue the Sender Party's Business Identifier, as specified in the BPC Identifier Policy.
└ ReceiverParty	1..1	The Access Point *receiving the MLR* (i.e., the Corner 2 Access Point who sent the business document message).
└└ PartyIdentification	1..1	Identification of the Receiver Party.

Element or attribute	Cardinality	Definition and use
└└└ ID	1..1	The Business Identifier used to identify the Receiver Party in the network, as specified in the BPC Identifier Policy.
└└└ ID/@schemeID	1..1	The identifier of the scheme used to issue the Receiver Party's Business Identifier, as specified in the BPC Identifier Policy.
└ DocumentResponse	1..n	Contains information about a specific error that has been found with a received business document message and which is preventing the receiving Access Point (Corner 3) from processing the business document. An MLR MUST contain exactly one Document Response element per error that has been found. An MLR MUST contain at least one Document Response element. Consequently, the MLR MUST contain all errors found.
└└ Response	1..1	Contains information about a specific error.
└└└ ResponseCode	1..1	A code signifying the type of response. The code MUST be exactly `RE` from the UNCL4343 code list meaning that the Document Response is a *rejection* of a received business document message. It is included for improved compatibility with networks in other geographic regions.
└└└ Description	1..1	A meaningful human readable text in the English language providing information about the error that has been found and why it is preventing the business document from being processed.
└└└ Status	1..1	Additional information about the status of the Document Response.
└└└└ StatusReasonCode	1..1	A code signifying the type of error encountered. MUST be from the code list in section 4.1 of this document.
└└ DocumentReference	1..n	Contains information that references the document in which the error was found. The Document Response MUST be unambiguously referencing the business document message that it is responding to, and therefore MUST contain at least one Document Reference element with sufficient information to identify the original message. The Document Response MUST include a reference to the AS4 message. The Document Response MUST include a reference to the XHE envelope when it is available. The Document Response SHOULD include a reference to the business document.
└└└ ID	1..1	The identifier of the document being referenced.
└└└ IssueDate	0..1	The OPTIONAL date that the referenced document was issued, that it may help the receiver of the MLR finding the document.
└└└ IssueTime	0..1	The OPTIONAL time that the referenced document was issued, that it may help the receiver of the MLR finding the document.
└└└ DocumentTypeCode	1..1	A code signifying whether the referenced document is the business document, its containing envelope or the AS4 message.

Element or attribute	Cardinality	Definition and use
		The code MUST be from the code list in section 4.2 of this document. A Document Response MUST NOT contain more than one Document Reference with the same Document Type Code.
└└└ IssuerParty	0..1	The party issuing the document being referenced. The Issuer Party MUST be included when referencing document types such as UBL business documents and XHE envelopes, where the document identifier only becomes unique and unambiguous in combination with the party creating the identifier. The Issuer Party is OPTIONAL when referencing document types such as AS4 messages, where the document identifier is truly unique or where the relation between the document identifier and the Issuer Party is already established elsewhere.
└└└└ PartyIdentification	1..1	Identification of the Issuer Party of the referenced document.
└└└└└ ID	1..1	The Business Identifier used to identify the Issuer Party of the referenced document.
└└└└└ ID/@schemeID	1..1	The identifier of the scheme used to issue the Issuer Party's Business Identifier, as specified in the BPC Identifier Policy.

5 Code lists

5.1 Case sensitivity

All codes in the code lists when encountered in a MLR document MUST be treated as *case insensitive*.

5.2 Status Reason Codes

Code	Meaning
NV	Network Violation. An error related to the network information or configuration, and which prevents a business document from being processed. For example, a business document sent to a corner 3 Access Point that is unrelated to the intended recipient (Corner 4), or a business document type which is not supported by the corner 3 Access Point on behalf of the intended recipient.
SV	Syntax Violation. An error related to the technical structure of a business document or its containing envelope, typical XML schema errors, wrong encoding, and similar errors that prevent the receiving Access Point from parsing the document correctly.
BV	Data Integrity Constraint Violation. An error related to the content of a business document, and which prevents the document from being processed. For example, missing elements or wrong number of elements, wrong use of code lists, or arithmetic or logical errors.

5.3 Document Type Codes

Code	Meaning
BUS	Code signifying that the Document Reference is a reference to the business document that is the payload of the XHE envelope.
XHE	Code signifying that the Document Reference is a reference to an XHE envelope containing or referencing a business document.
AS4	Code signifying that the Document Reference is a reference to the AS4 message carrying the business document message.

6 Appendix A: Examples (non-normative)

6.1 A.1: Example Message Level Response message

```
<?xml version="1.0" encoding="UTF-8"?>
<ApplicationResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns="urn:oasis:names:specification:ubl:schema:xsd:ApplicationResponse-2"
 xmlns:cac="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2"
 xmlns:cbc="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2">
  <cbc:UBLVersionID>2.3</cbc:UBLVersionID>
  <cbc:CustomizationID>urn:oasis:names:specification:ubl:schema:xsd: ApplicationResponse-
2::ApplicationResponse##bpc-1.0-messagelevelresponse</cbc:CustomizationID>
  <cbc:ID>example-mlr-1234</cbc:ID>
  <cbc:IssueDate>2022-06-26</cbc:IssueDate>
  <cbc:IssueTime>10:30:00Z</cbc:IssueTime>
  <cac:SenderParty>
    <cac:PartyIdentification>
      <cbc:ID schemeID="DUNS">123456789</cbc:ID>
    </cac:PartyIdentification>
  </cac:SenderParty>
  <cac:ReceiverParty>
    <cac:PartyIdentification>
      <cbc:ID schemeID="EIN">987654321</cbc:ID>
    </cac:PartyIdentification>
  </cac:ReceiverParty>
  <cac:DocumentResponse>
    <cac:Response>
      <cbc:ResponseCode>RE</cbc:ResponseCode>
      <cbc:Description>The invoice total is not equal to the sum of all invoice
lines</cbc:Description>
      <cac:Status>
        <cbc:StatusReasonCode>BV</cbc:StatusReasonCode>
      </cac:Status>
    </cac:Response>
    <cac:DocumentReference>
      <cbc:ID>invoice-2022-00011</cbc:ID>
      <cbc:IssueDate>2022-06-26</cbc:IssueDate>
      <cbc:DocumentTypeCode>BUS</cbc:DocumentTypeCode>
      <cac:IssuerParty>
        <cac:PartyIdentification>
          <cbc:ID schemeID="GLN">1234567890123</cbc:ID>
        </cac:PartyIdentification>
      </cac:IssuerParty>
    </cac:DocumentReference>
    <cac:DocumentReference>
      <cbc:ID>xhe-123456789</cbc:ID>
      <cbc:IssueDate>2022-06-26</cbc:IssueDate>
      <cbc:IssueTime>10:29:59Z</cbc:IssueTime>
      <cbc:DocumentTypeCode>XHE</cbc:DocumentTypeCode>
      <cac:IssuerParty>
        <cac:PartyIdentification>
          <cbc:ID schemeID="GLN">1234567890123</cbc:ID>
        </cac:PartyIdentification>
      </cac:IssuerParty>
    </cac:DocumentReference>
    <cac:DocumentReference>
      <cbc:ID>987654321</cbc:ID>
      <cbc:IssueDate>2022-06-26</cbc:IssueDate>
      <cbc:IssueTime>10:29:59Z</cbc:IssueTime>
      <cbc:DocumentTypeCode>AS4</cbc:DocumentTypeCode>
    </cac:DocumentReference>
  </cac:DocumentResponse>
```

```
</ApplicationResponse>
```

6.2 A.2: Example SMP ServiceGroup entry

```
<?xml version="1.0" encoding="UTF-8"?>
<ServiceGroup xmlns:smb="http://docs.oasis-open.org/bdxr/ns/SMP/2/BasicComponents"
    xmlns:ext="http://docs.oasis-open.org/bdxr/ns/SMP/2/ExtensionComponents"
    xmlns:sma="http://docs.oasis-open.org/bdxr/ns/SMP/2/AggregateComponents"
    xmlns="http://docs.oasis-open.org/bdxr/ns/SMP/2/ServiceGroup">
  <smb:SMPVersionID>2.0</smb:SMPVersionID>
  <smb:ParticipantID schemeID="DUNS">123456789</smb:ParticipantID>
  <sma:ServiceReference>
    <smb:ID schemeID="bdx-docid-
qns">urn:oasis:names:specification:ubl:schema:xsd:ApplicationResponse-2::ApplicationResponse##bpc-
1.0-messagelevelresponse</smb:ID>
  </sma:ServiceReference>
</ServiceGroup>
```

6.3 A.3: Example SMP ServiceMetadata entry

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ServiceMetadata xmlns:smb="http://docs.oasis-open.org/bdxr/ns/SMP/2/BasicComponents"
    xmlns:ext="http://docs.oasis-open.org/bdxr/ns/SMP/2/ExtensionComponents"
    xmlns:sma="http://docs.oasis-open.org/bdxr/ns/SMP/2/AggregateComponents"
    xmlns="http://docs.oasis-open.org/bdxr/ns/SMP/2/ServiceMetadata">
  <smb:SMPVersionID>2.0</smb:SMPVersionID>
  <smb:ID schemeID="bdx-docid-qns" >urn:oasis:names:specification:ubl:schema:xsd:ApplicationResponse-
2::ApplicationResponse##bpc-1.0-messagelevelresponse</smb:ID>
  <smb:ParticipantID schemeID="DUNS">123456789</smb:ParticipantID>
  <sma:ProcessMetadata>
    <sma:Endpoint>
      <!-- ... -->
    </sma:Endpoint>
  </sma:ProcessMetadata>
</ServiceMetadata>
```