# OneHealthPort
# Clinical Data Repository

## Automated Schema Validation for CCDs

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*Created by and for the local healthcare community, OneHealthPort solves information exchange and workflow problems shared across healthcare organizations.*

# Automated CCD Schema Validation

- Beginning March 1, 2019 the OneHealthPort CDR automatically validates CCDs submitted to the CDR for file format conformance.

- CCDs are validated against the HL7 CDA_R2 standard.

  - The standard validation source used by the CDR is the IPF Open eHealth Integration Platform for schema validation (https://github.com/oehf/ipf/blob/master/modules/cda/core/src/main/resources/schema/ccda/infrastructure/cda/CDA_SDTC.xsd)

# Why Automate the Validation?

- When non-conforming CCDs are submitted to the CDR, the CCD document displays in the Clinical Portal, but none of the data contained in the CCD parses in the patient record.

- **Automating the validation of CCDs:**

  - Eliminates the need for organizations to manually validate CCDs prior to submission.

  - Provides specific feedback to the submitter (in the error response message) identifying file format conformance errors so the CCD can be corrected and resubmitted.

  - Improves the quality of the data in the CDR by rejecting files that fail format conformance and do not process correctly in the patient record.

# Impact to CCD Submission Process

- The automated validation tool:
  - **<u>Does not</u>**
    - Impact the methods organizations use today to submit the CCDs to the CDR.
    - Change the actual format of the error messages sent back by the CDR.
  - **<u>Does</u>**
    - Provide immediate information in the error message regarding format validation errors.

# What Organizations Need to Know

- The automated validation process:
  - Allows conforming CCDs to be processed by the CDR.
  - Rejects non-conforming CCDs.

- New, detailed error message content will return to organizations submitting non-conforming CCDs.

- The automated validation tool is set up in the UAT (test) and Production environments of the CDR.

- CCD submissions prior to the implementation of the automated validation tool are not affected.

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# New, Detailed Error Message

- There can be a variety of content in any given error message which is dependent upon the content in the submitted CCD that does not conform to the standard.

- Multiple conformance issues within the same file will be returned in a single error response message.

- Direct Message and AS2 connectivity error messages will include the file name used for the non-conforming CCD. Web service transactions do not capture file names.

# Legend for Error Message Examples that Follow

- **Error Codes**

- **Notification of a non-conforming file error**

- **Detailed validation error content**

# Web Service Error Message Examples

**Sample web service error message with <u>single</u> validation error:**

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns="urn:hl7-org:v3">
        <soap:Body>
                <ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007"
xmlns:ns5="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-
regrep:xsd:query:3.0" status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure">
                        <ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error">
                                <ns3:RegistryError codeContext="The clinical document you
submitted to the CDR on Fri Feb 15 10:56:36 PST 2019, , has failed the CDA R2 base standard conformance.
The validation error(s) in your file follow: CCD Validation Error: lineNumber: 33; columnNumber: 202; cvc-
pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD
Validation Error: lineNumber: 33; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of
attribute `code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`. "
errorCode="InvalidDocumentContent" severity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error"/>
                        </ns3:RegistryErrorList>
                </ns3:RegistryResponse>
        </soap:Body>
</soap:Envelope>
```

# Web Service Error Message Examples

**Sample web service error message with <u>multiple</u> validation errors:**

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns="urn:hl7-org:v3">
        <soap:Body>
                    <ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007"
xmlns:ns5="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure">
                            <ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error">
                                <ns3:RegistryError codeContext="The clinical document you submitted to the CDR on
Fri Feb 15 10:57:39 PST 2019, , has failed the CDA R2 base standard conformance. The validation error(s) in your file follow: CCD
Validation Error: lineNumber: 32; columnNumber: 153; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect
to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 32; columnNumber: 153; cvc-attribute.3: The value `Not a valid
code` of attribute `code` on element `maritalStatusCode` is not valid with respect to its type, `cs`. CCD Validation Error:
lineNumber: 34; columnNumber: 202; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+`
for type `cs`. CCD Validation Error: lineNumber: 34; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute
`code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 36;
columnNumber: 151; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`.
CCD Validation Error: lineNumber: 36; columnNumber: 151; cvc-attribute.3: The value `Not a valid code` of attribute `code` on
element `raceCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 38; columnNumber: 175; cvc-
pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error:
lineNumber: 38; columnNumber: 175; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element
`ethnicGroupCode` is not valid with respect to its type, `cs`. " errorCode="InvalidDocumentContent"
severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"/>
                            </ns3:RegistryErrorList>
                        </ns3:RegistryResponse>
        </soap:Body>
</soap:Envelope>
```

# Web Service Error Message Examples

**Sample web service error message with <u>multiple error types</u> – patient match and multiple validation errors:**

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns="urn:hl7-org:v3">
        <soap:Body>
                <ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007"
xmlns:ns5="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure">
                        <ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error">
                                <ns3:RegistryError codeContext="Unknown Patient Id [XXX] specified in request"
errorCode="XDSUnknownPatientId" severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"/>
                                <ns3:RegistryError codeContext="The clinical document you submitted to the CDR on
Fri Feb 15 10:56:36 PST 2019, , has failed the CDA R2 base standard conformance. The validation error(s) in your file follow: CCD
Validation Error: lineNumber: 33; columnNumber: 153; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect
to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 33; columnNumber: 153; cvc-attribute.3: The value `Not a valid
code` of attribute `code` on element `maritalStatusCode` is not valid with respect to its type, `cs`. CCD Validation Error:
lineNumber: 35; columnNumber: 202; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+`
for type `cs`. CCD Validation Error: lineNumber: 35; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute
`code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 37;
columnNumber: 151; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`.
CCD Validation Error: lineNumber: 37; columnNumber: 151; cvc-attribute.3: The value `Not a valid code` of attribute `code` on
element `raceCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 39; columnNumber: 175; cvc-
pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error:
lineNumber: 39; columnNumber: 175; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element
`ethnicGroupCode` is not valid with respect to its type, `cs`. " errorCode="InvalidDocumentContent"
severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"/>
                        </ns3:RegistryErrorList>
                </ns3:RegistryResponse>
        </soap:Body>
</soap:Envelope>
```

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# AS2 Connectivity Error Message Examples

**Sample AS2 connectivity error message with <u>single</u> validation error:**

```
<ExchangeFailureEvent xmlns="urn:hl7-org:v3">
        <Failure>
                <TimeStamp>2019-02-15 10:49:08</TimeStamp>
                <ExchangeId/>
                <FailureMessage/>
                <Response>&lt;HttpResponse xmlns="urn:hl7-org:v3"&gt;&lt;Body boundary="uuid:19c0076b-3709-48de-86f2-
79346cf2bc02" multipart="yes"&gt;&lt;Part&gt;&lt;Headers&gt;&lt;Content-Type&gt;application/xop+xml; charset=UTF-8;
type="application/soap+xml"&lt;/Content-Type&gt;&lt;Content-Transfer-Encoding&gt;binary&lt;/Content-Transfer-
Encoding&gt;&lt;Content-ID&gt;&amp;lt;root.message@cxf.apache.org&amp;gt;&lt;/Content-ID&gt;&lt;/Headers&gt;&lt;Content
multipart="no"&gt;&lt;soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-
envelope"&gt;&lt;soap:Body&gt;&lt;ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007" xmlns:ns5="urn:oasis:names:tc:ebxml-
regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0" status="urn:oasis:names:tc:ebxml-
regrep:ResponseStatusType:Failure"&gt;&lt;ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error"&gt;&lt;ns3:RegistryError codeContext="The clinical document you submitted to the CDR on Fri Feb 15
10:49:07 PST 2019, 7uycso50@single-validation-error-a33819fc-bf77-4ec9-9af7-e1c13c75e3f6.xml, has failed the CDA R2 base standard
conformance. The validation error(s) in your file follow: CCD Validation Error: lineNumber: 33; columnNumber: 202; cvc-pattern-valid:
Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 33;
columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `religiousAffiliationCode` is not valid
with respect to its type, `cs`. " errorCode="InvalidDocumentContent" severity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error"/&gt;&lt;/ns3:RegistryErrorList&gt;&lt;/ns3:RegistryResponse&gt;&lt;/soap:Body&gt;&lt;/soap:Envelope&g
t;&lt;/Content&gt;&lt;/Part&gt;&lt;/Body&gt;&lt;/HttpResponse&gt;</Response>
        </Failure>
        <OriginalMessage>
                <FileName>7uycso50@single-validation-error-a33819fc-bf77-4ec9-9af7-e1c13c75e3f6.xml</FileName>
        </OriginalMessage>
</ExchangeFailureEvent>
```

# AS2 Connectivity Error Message Examples

**Sample web service error message with <u>multiple</u> validation errors:**

<ExchangeFailureEvent xmlns="urn:hl7-org:v3">
    <Failure>
        <TimeStamp>2019-02-15 10:49:07</TimeStamp>
        <ExchangeId/>
        <FailureMessage/>
        <Response>&lt;HttpResponse xmlns="urn:hl7-org:v3"&gt;&lt;Body boundary="uuid:19c0076b-3709-48de-86f2-79346cf2bc02" multipart="yes"&gt;&lt;Part&gt;&lt;Headers&gt;&lt;Content-Type&gt;application/xop+xml; charset=UTF-8; type="application/soap+xml"&gt;&lt;/Content-Type&gt;&lt;Content-Transfer-Encoding&gt;binary&lt;/Content-Transfer-Encoding&gt;&lt;Content-ID&gt;&amp;lt;root.message@cxf.apache.org&amp;gt;&lt;/Content-ID&gt;&lt;/Headers&gt;&lt;Content multipart="no"&gt;&lt;soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"&gt;&lt;soap:Body&gt;&lt;ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0" xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007" xmlns:ns5="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0" status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure"&gt;&lt;ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"&gt;&lt;ns3:RegistryError codeContext="**The clinical document you submitted to the CDR on Fri Feb 15 10:49:06 PST 2019, 7uycso50@multiple-validation-errors-a1a971a1-3114-45fa-9ea0-69b72cb20710.xml, has failed the CDA R2 base standard conformance**. The validation error(s) in your file follow: CCD Validation Error: lineNumber: 32; columnNumber: 153; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 32; columnNumber: 153; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `maritalStatusCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 34; columnNumber: 202; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 34; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`.**" errorCode="InvalidDocumentContent**" severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"/&gt;&lt;/ns3:RegistryErrorList&gt;&lt;/ns3:RegistryResponse&gt;&lt;/soap:Body&gt;&lt;/soap:Envelope&gt;&lt;/Content&gt;&lt;/Part&gt;&lt;/Body&gt;&lt;/HttpResponse&gt;</Response>
    </Failure>
    <OriginalMessage>
        <FileName>7uycso50@multiple-validation-errors-a1a971a1-3114-45fa-9ea0-69b72cb20710.xml</FileName>
    </OriginalMessage>
</ExchangeFailureEvent>

# AS2 Connectivity Error Message Examples

**Sample AS2 connectivity error message with <u>multiple error types</u> – patient match and multiple validation errors:**

```
<ExchangeFailureEvent xmlns="urn:hl7-org:v3">
        <Failure>
                <TimeStamp>2019-02-15 10:49:08</TimeStamp>
                <ExchangeId/>
                <FailureMessage/>
                <Response>&lt;HttpResponse xmlns="urn:hl7-org:v3"&gt;&lt;Body boundary="uuid:19c0076b-3709-48de-86f2-
79346cf2bc02" multipart="yes"&gt;&lt;Part&gt;&lt;Headers&gt;&lt;Content-Type&gt;application/xop+xml; charset=UTF-8;
type="application/soap+xml"&lt;/Content-Type&gt;&lt;Content-Transfer-Encoding&gt;binary&lt;/Content-Transfer-Encoding&gt;&lt;Content-
ID&gt;&amp;lt;root.message@cxf.apache.org&amp;gt;&lt;/Content-ID&gt;&lt;/Headers&gt;&lt;Content multipart="no"&gt;&lt;soap:Envelope
xmlns:soap="http://www.w3.org/2003/05/soap-envelope"&gt;&lt;soap:Body&gt;&lt;ns3:RegistryResponse xmlns:ns3="urn:oasis:names:tc:ebxml-
regrep:xsd:rs:3.0" xmlns:ns2="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:ns4="urn:ihe:iti:xds-b:2007"
xmlns:ns5="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0" xmlns:ns6="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure"&gt;&lt;ns3:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error"&gt;&lt;ns3:RegistryError codeContext="Unknown Patient Id [XXX] specified in request"
errorCode="XDSUnknownPatientId" severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error"/&gt;&lt;ns3:RegistryError
codeContext="The clinical document you submitted to the CDR on Fri Feb 15 10:49:07 PST 2019, 7uycso50@multiple-validation-and-patient-
errors-c7e0a704-bd66-41e0-919d-b5f372370955.xml, has failed the CDA R2 base standard conformance. The validation error(s) in your file
follow: CCD Validation Error: lineNumber: 33; columnNumber: 153; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to
pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 33; columnNumber: 153; cvc-attribute.3: The value `Not a valid code` of attribute
`code` on element `maritalStatusCode` is not valid with respect to its type, `cs`. CCD Validation Error: lineNumber: 35; columnNumber: 202; cvc-
pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 35;
columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `religiousAffiliationCode` is not valid with
respect to its type, `cs`." errorCode="InvalidDocumentContent" severity="urn:oasis:names:tc:ebxml-
regrep:ErrorSeverityType:Error"/&gt;&lt;/ns3:RegistryErrorList&gt;&lt;/ns3:RegistryResponse&gt;&lt;/soap:Body&gt;&lt;/soap:Envelope&gt;&lt;/Co
ntent&gt;&lt;/Part&gt;&lt;/Body&gt;&lt;/HttpResponse&gt;</Response>
        </Failure>
        <OriginalMessage>
                <FileName>7uycso50@multiple-validation-and-patient-errors-c7e0a704-bd66-41e0-919d-b5f372370955.xml</FileName>
        </OriginalMessage>
</ExchangeFailureEvent>
```

# Direct Mail Error Message Examples

**Sample Direct error message with validation error:**

The OneHealthPort Clinical Data Repository was unable to process your document.

File Name single-validation-error.xml

**The clinical document you submitted to the CDR on Sat Nov 09 20:13:34 UTC 2019, , has failed the CDA R2 base standard conformance.** The validation error(s) in your file follow: CCD Validation Error: lineNumber: 33; columnNumber: 202; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 33; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`.

# Direct Mail Error Message Examples

**Sample Direct error message with multiple error types – patient match and validation error:**

The OneHealthPort Clinical Data Repository was unable to process your document.

 File Name single-validation-error.xml

**"Unknown Patient Id [XXX] specified in request" errorCode="XDSUnknownPatientId"**
**"The clinical document you submitted to the CDR on Sat Nov 09 20:32:44 UTC 2019, , has failed the CDA R2 base standard conformance.** The validation error(s) in your file follow: CCD Validation Error: lineNumber: 34; columnNumber: 202; cvc-pattern-valid: Value `Not a valid code` is not facet-valid with respect to pattern `[^\s]+` for type `cs`. CCD Validation Error: lineNumber: 34; columnNumber: 202; cvc-attribute.3: The value `Not a valid code` of attribute `code` on element `religiousAffiliationCode` is not valid with respect to its type, `cs`. "