



OneHealthPort Clinical Data Repository

Automated Schema Validation for CCDs

Automated CCD Schema Validation

- Beginning March 1, 2019 the OneHealthPort CDR will automatically validate CCDs submitted to the CDR for file format conformance.
- CCDs will be 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:
 - **Does not**
 - 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.
 - **Does**
 - Provide immediate information in the error message regarding format validation errors.
 - Include the URL in the error message to the C-CDA Validation Testing tool located on the OneHealthPort HIE Applications Portal website.

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 in web service and AS2 connection transactions.
- Direct message error responses do not contain the same level of detail about the validation error.
- 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.

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 for web service and AS2 connectivity.
- Direct and AS2 connectivity error messages will include the file name used for the non-conforming CCD. Web service transactions do not capture file names.
- A URL to the validation tool located at the OneHealthPort HIE Applications Portal is provided for reference and further testing.

Legend for Error Message Examples that Follow

- **Error Codes**
- **Notification of a non-conforming file error**
- **URL for OneHealthPort web application validation tool**
- **Detailed validation error content**

Web Service Error Message Examples

Sample web service error message with single 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."
        To see the actual error validation content submit your document to our CCDa validator at
        https://identity.onehealthport.com/EmpowerIDWebIdPForms/Login/VALIDATOR to get detailed error
        information. 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 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="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. To see the actual error validation content submit
        your document to our CCDa validator at https://identity.onehealthport.com/EmpowerIDWebIDPForms/Login/VALIDATOR to get
        detailed error information. 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 multiple error types – 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. To see the actual error validation content submit
your document to our CCDa validator at https://identity.onehealthport.com/EmpowerIDWebIdPForms/Login/VALIDATOR to get
detailed error information. 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>
```

AS2 Connectivity Error Message Examples

Sample AS2 connectivity error message with single 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. To see the actual error validation content submit your document to our CCD validator at https://identity.onehealthport.com/EmpowerIDWebIdPForms/Login/VALIDATOR to get detailed error information. 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&gt;&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 [multiple](#) 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"&lt;/Content-Type&gt;&lt;Content-Transfer-Encoding&gt;binary&lt;/Content-Transfer-Encoding&gt;&lt;Content-ID&gt;&lt;root.message@xf.apache.org&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. To see the actual error validation content submit your document to our CCDa validator at https://identity.onehealthport.com/EmpowerIDWebIdPForms/Login/VALIDATOR to get detailed error information. 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 [multiple error types](#) – 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;HttpResponseBody 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;&lt;root.message@cxf.apache.org&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. To see the actual error validation content submit your document to our CCDa validator at https://identity.onehealthport.com/EmpowerIDWebIDPForms/Login/VALIDATOR to get detailed error information. 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;/Content&gt;&lt;/Part&gt;&lt;/Body&gt;&lt;/HttpResponseBody&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

Error Message: **The clinical document you submitted to the CDR has failed the CDA R2 base standard conformance** (**errorCode: InvalidDocumentContent**). To see the actual error

validation content submit your document to our CCDA validator at

<https://identity.onehealthport.com/EmpowerIDWebIDPForms/Login/VALIDATOR> to get detailed error information. Please contact OneHealthPort to resolve issues using the online support form at this url: <http://www.formstack.com/forms/?1688456-sjNVJY8V7I>

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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-and-patient-errors.xml
- Error Message: The OneHealthPort CDR could not identify the Patient based on the information included in your message (**errorCode: XDSUnknownPatientId**). **The clinical document you submitted to the CDR has failed the CDA R2 base standard conformance (errorCode: InvalidDocumentContent)**. To see the actual error validation content submit your document to our CCDA validator at <https://identity.onehealthport.com/EmpowerIDWebIDPForms/Login/VALIDATOR> to get detailed error information. Please contact OneHealthPort to resolve issues using the online support form at this url: <http://www.formstack.com/forms/?1688456-sjNVJY8V7I>