

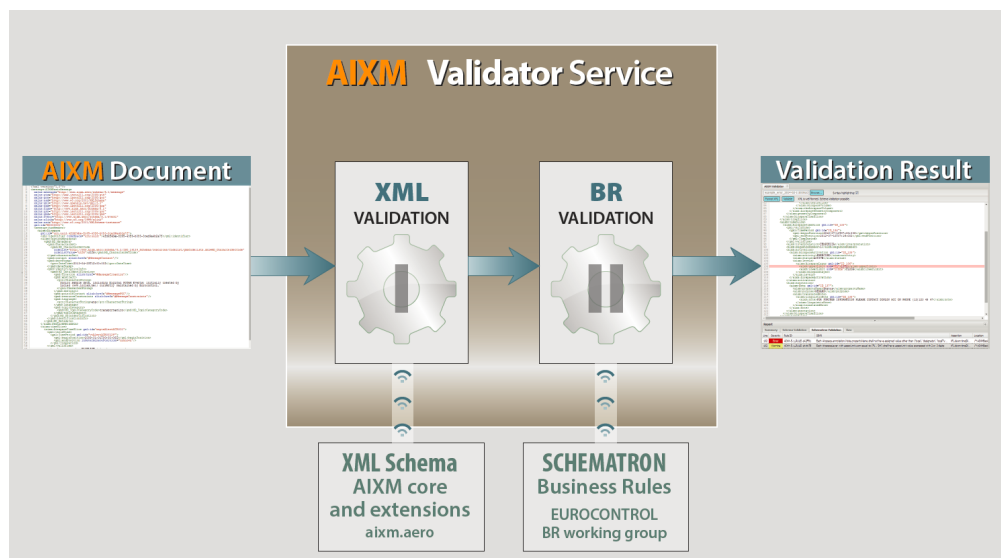
Perfectly valid AIXM datasets - the key enabler for ADQ

The AIXM Validator Service is a web service for generating comprehensive validity reports for XML-encoded AIXM datasets. It has been implemented as an OGC-compliant Web Processing Service (WPS) that can be accessed using any standard-compliant WPS client. Additionally, an easy-to-use web interface is available that allows to load and edit AIXM data in a web browser and display the validation results in a user-friendly way.

XML Schema validation is probably a common task for AIXM application developers. Using the online AIXM Validator it is easy to detect and correct XML Schema violations without any additional software. Besides schema-validity, the validator checks for business rules validity. Business rules are complex dependencies and domain specific requirements that must be satisfied by AIXM datasets. These rules cannot be expressed using XML Schema (XSD), but are encoded using the Schematron language and custom XPath function. The validator uses Schematron rules based on the rule set from the ongoing efforts in the EUROCONTROL AIXM Business Rules community project.

XML Schema Validation

The AIXM Schema is a GML application schema that encodes the AIXM objects and properties. XML Schema Validation has been implemented using the Xerces2J parser and the latest published AIXM core and extension schemas.



It maintains a local copy of the official AIXM schemas with support for different root elements for specialized extensions (e.g. eASM). Schema location (xsi) information will be suppressed to apply always the maintained copy of the official AIXM schemas. All Schema validation failures are returned in the WPS response that contains precise information about the column and line where the error was found.

Schematron Business Rules Validation

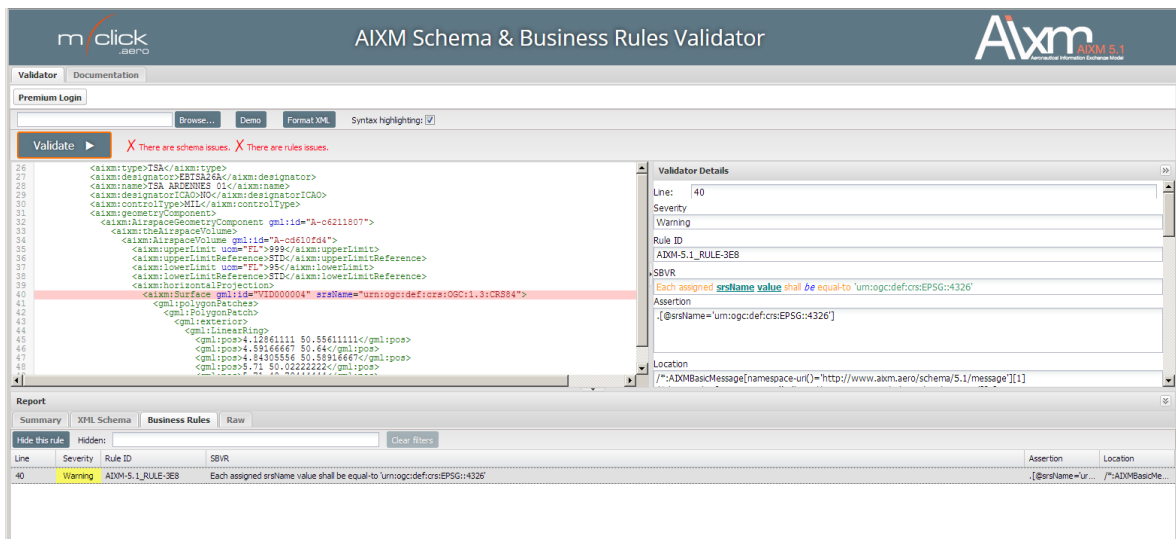
The AIXM Schema file defines the XML structure (allowed elements and attributes, ordering). However, not every constraint can be expressed using XML schema. These constraints (e.g. dependencies between the values of different attributes) are called "business rules" and have been encoded using the Schematron language.

After the XML schema validation the Schematron business rule validation is performed. The validator uses the ISO implementation of Schematron with some custom XPath functions that are used for some checks which are hard to express using the standard function set (e.g. topological operators).

The Schematron result is a XML document containing an exact list of all assertion failures, as well as some general information about the validation. This document is transformed to a more user-friendly XML structure (similar to the Schema validation result) and also included in the response that is returned to the WPS client.

AIXM Validator web interface

The web interface provides a web-based XML editor for loading and editing smaller AIXM datasets. As a first step, the XML document is checked for well-formedness. If the



AIXM document passes this check, the validation process can be executed. The document is sent to the AIXM Validation WPS and the result set will be displayed in the summary tab. If XML Schema issues or Schematron Business Rules issues are detected, a list of all affected rows will be displayed. A click on a single issue in the table scrolls the AIXM document to the code position where the error occurs or the business rule was not satisfied.

This free service is available on the web:

<https://swim.m-click.aero/validator/>

m-click.aero • Berlin • Germany

Contact: Matthias Pohl • Mail: matthias.pohl@m-click.aero