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VERSION 1.0

**ShEx Validation of RDF FHIR Resources**

**What is this document for?**

This document provides instructions for setting up and running the shex.js FHIR RDF data resource validation tool. This shex.js tool is software that analyzes FHIR RDF resources for compliance with the [FHIR RDF standard](https://www.hl7.org/fhir/rdf.html).

**How is this document organized?**

The steps for validating FHIR RDF files can be divided into three broad categories:  
  
 I. SET UP

II. ADD THE REQUIRED PATHS

III. LOAD ShEx FILES IN THE shex.js SERVER  
 &  
 IV. TEST/VALIDATE FHIR RDF RESOURCES

V. ANALYZE THE FHIR RDF VALIDATION OUTPUT

Step I (and sometimes Step II) may be completed just once on a local machine. Steps II, III, and IV typically must be done each time FHIR RDF resources are to be validated using shex.js.

**I. SET UP THE DIRECTORIES REQUIRED FOR THE VALIDATION:**

To get started, use the command line interface on your local machine to do the following:

**Clone the repositories:**

**Step I-A**. Clone the following github repository for shex.js, the tool that can be used for the validating the RDF files using the ShEx schema:

<https://github.com/shexjs/shex.js>

Command for cloning:

git clone <https://github.com/shexjs/shex.js.git>

This command creates a folder called shex.js. Check to make sure you can see  
 that new folder.

**Step I-B**. Clone the following repository for fetching the ShEx files which will be for validating the FHIR-RDF files:

<https://github.com/fhircat/ShExValidation>

Command for cloning:

git clone <https://github.com/fhircat/ShExValidation>

Creates a folder called ShExValidation. Check to make sure you can see that new folder.

**II. ADD THE REQUIRED PATHS TO THE SYSTEM**

**Add a path like the following path to your local machine using the steps appropriate for your operating system. Here are some examples to go by:**

Command For MacOS and LINUX:

export PATH="$PATH:**YOUR-PATH-HERE**/[shex.js/packages/shex-cli/bin](http://shex.js/packages/shex-cli/bin)"

Steps for Windows:

1. Go to **Control Panel** > **System Properties** > **Advanced** > **Environment Variables**.
2. Select **PATH** and click **Edit**.
3. Add the path ‘**YOUR-PATH-HERE**/[shex.js/packages/shex-cli/bin](http://shex.js/packages/shex-cli/bin)’
4. Append a semi-colon (;) followed by the "bin" directory in path.
5. Click **OK** twice to save.

**III. LOAD THE ShEx FILES IN THE SERVER FOR VALIDATION**

3. Load the ShEx files to validate the FHIR-RDF files using the following command:

General Command:

validate --human -x **YOUR-PATH-HERE**/ShExValidation/fhir\_rdf\_validation/ShExSchemas/R5Plus/Organization.shex --diagnose -S http://localhost:8088/validate

Example of using this command on the MiServer machine at UMich:

validate --human -x /usr/local/miserver/shexdir/ShExValidation/fhir\_rdf\_validation/ShExSchemas/R5Plus/Organization.shex --diagnose -S <http://localhost:8088/validate>

This command should load ~819 .shex files for use during FHIR-RDF validation.

**IV. TEST/VALIDATE THE FHIR RDF FILES**

4. Test the required FHIR RDF file in the .ttl format using the following command:

General Command:

curl -i http://localhost:8088/validate -F "data=@/[PATH TO THE .ttl file]" -F "queryMap={FOCUS fhir:nodeRole fhir:treeRoot}@<[Type of the resource being validated]>"

Command on the server:

curl -i http://localhost:8088/validate -F "data=@/usr/local/miserver/shexdir/ShExValidation/fhir\_rdf\_validation/FHIR\_RDF\_Examples/R5/[Name of the .ttl file]" -F "queryMap={FOCUS fhir:nodeRole fhir:treeRoot}@<Type of the resource being validated>"

Example of a command for validating a sample observation resource:

curl -i http://localhost:8088/validate -F "data=@/usr/local/miserver/shexdir/ShExValidation/fhir\_rdf\_validation/FHIR\_RDF\_Examples/R5/observation-example-eye-color.ttl" -F "queryMap={FOCUS fhir:nodeRole fhir:treeRoot}@<Observation>"

If the output does not display, login again to the server and enter the command above once again and examine the output.

**V. ANALYZE THE OUTPUT OF THE VALIDATION**

The output of the FHIR-RDF validation should then appear on the screen.

If any FHIR-RDF validation errors are present, then **the first five lines of the output** specifying the metadata of the output should indicate the presence of the error.