Last edited by <u>Ondřej Vašíček</u> 19 minutes ago

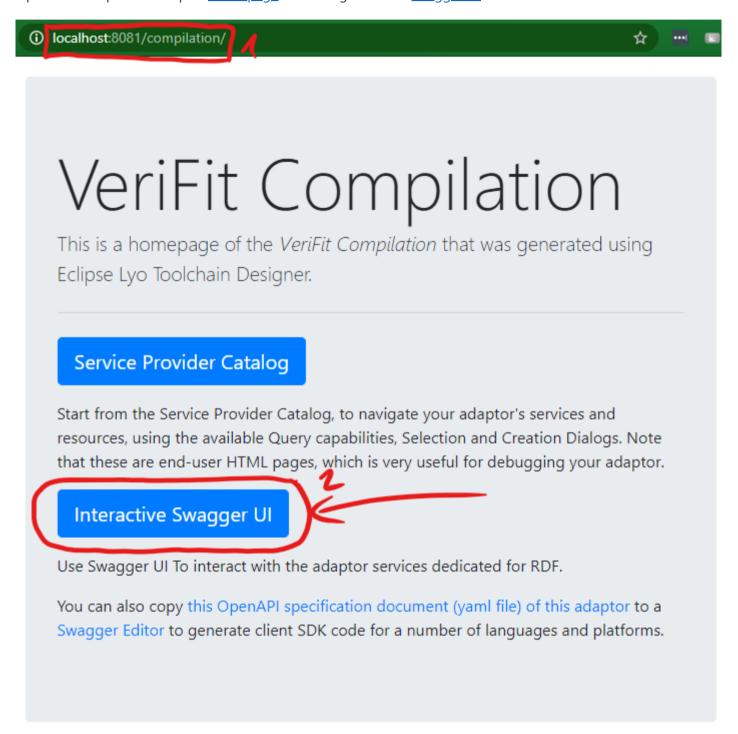
## 3. Analysis Using SwaggerUI

This guide includes links to the adapter's API. These links will only work if the adapter is running on localhost with default host:port configuration.

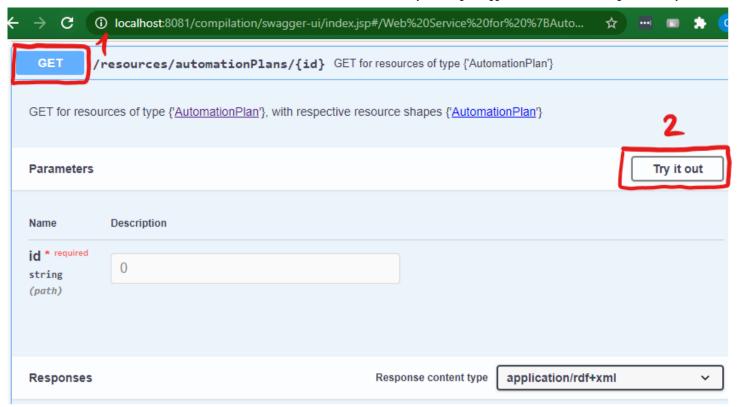
An alternative to this tutorial is the Postman Tutorial collection. That one, however, requires Postman to be installed.

## 1) Create an SUT

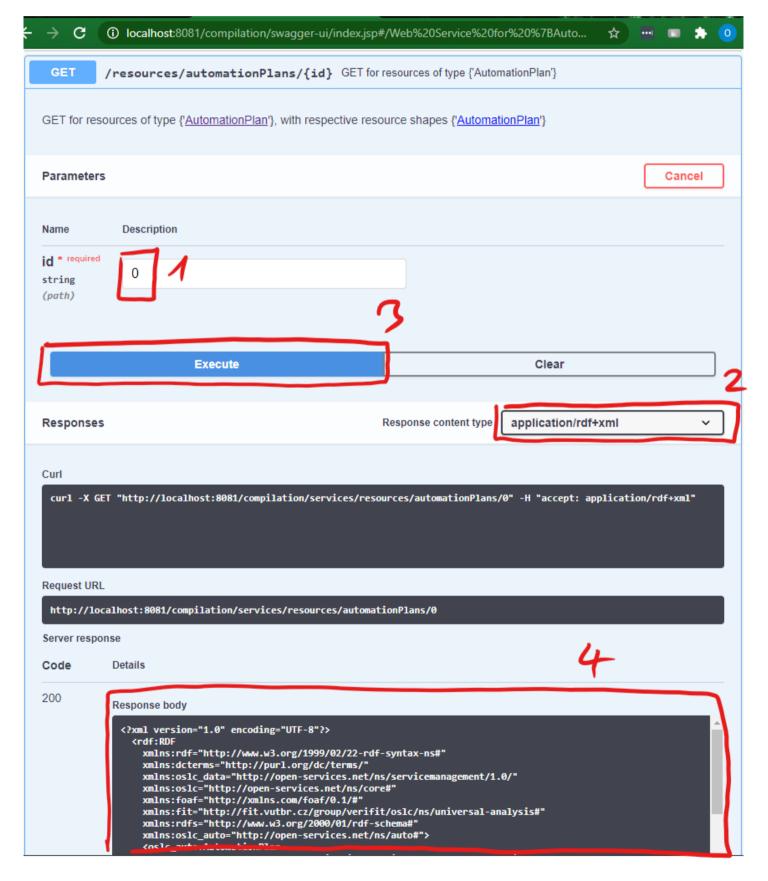
Open the Compilation adapter home page. And navigate to the swagger UI.



Find and expand the Automation Plan GET (or alt) capability (1) and click the "try it out" button (2).



Set the ID to 0 (zero) (1) and pick your desired content type (2). Execute the request (3) and then look at the result (4) to learn about input parameters accepted by the Automation Plan which are defined using ParameterDefinition properties. The Automation Plan will look something like <u>this</u>.



Input parameters will include a number of source\* parameters (1), a build command and a launch command for the SUT (2), and other functional parameters like the compile parameter (3) which has a default value of true.

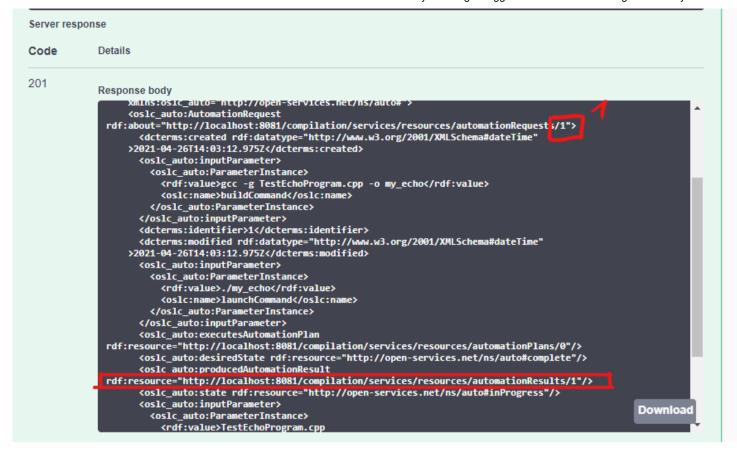
```
200
                Response body

<
                 value. IMPORTANT the value needs to specify a filename (to match with buildCommand). The filename should
                 be on the first line of the value, then the base64 encoded file as the second line (separated by a "\n"
                 </dcterms:description>
                              <oslc:name >sourceBase64
                           </oslc_auto:ParameterDefinition>
                         </oslc_auto:parameterDefinition>
                         <oslc auto:parameterDefinition>
                           <oslc auto:ParameterDefinition>
                              <oslc:occurs rdf:resource="http://open-services.net/ns/core#Zero-or-One"/>
                              <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
                 <dcterms:description rdf:parseType="Literal">How to build the SUT. The specified command will
be launched from the root directory of the downloaded SUT. Examples: make | ./build.sh | gcc -g -o
                 my_sut. If this command is missing or empty then compilation will not be performed (e.g. for static
                 analysis tools)</dcterms:description>
                              <oslc:name>buildCommand</>slc:name>
                           </oslc auto:ParameterDefinition>
                         </oslc auto:parameterDefinition>
                         <oslc_auto:parameterDefinition>
                           <oslc_auto:ParameterDefinition>
                              <oslc:occurs rdf:resource="http://open-services.net/ns/core#Zero-or-One"/>
                              <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
                              <dcterms:description rdf:parseType="Literal">Set this parameter to "false" to disable SUT
                 compilation.</dcterms:description>
                              <oslc:defaultValue>true</os/c:defaultValue>
                              <oslc:name>compile</oslc:name>
                                                                                                                                         Download
                           </oslc_auto:ParameterDefinition>
                         </oslc_auto:parameterDefinition>
```

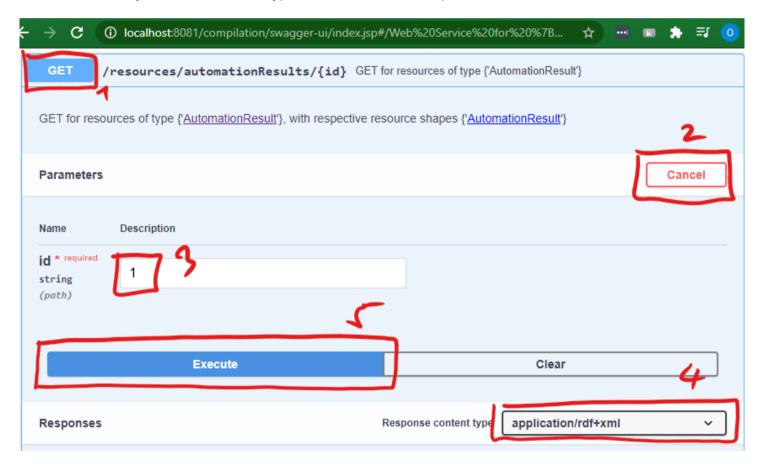
Next find and expand the <u>Automation Request POST</u> capability (1) and again click "try it out" (2). Paste your Automation Request into the input box (3), select your desired content type (4), and execute the request (5). The Automation Request needs to contain input parameters base on the executed Automation Plan and have a link to the executed Automation Plan. Input parameters in our case are an SUT source (sourceBase64), an SUT launchCommand and an SUT buildCommand. Try this <u>axample request</u>



The response to your request will look something like <u>this</u>. The created Automation Request will have a URI with a numerical ID at the end (1). And its most important property for us now is a link to the producedAutomationResult (2). Notice that the numberical ID of the A.Result is the same as of the A.Request this can be used as a shorcut for finding A.Results.



Now find and expand the <u>Automation Result GET</u> (or <u>alt</u>) capability (1) and again click "try it out" (2). Set the ID to match the ID of your Automation Result (3) (from the producedAutomationResult property in the previous screenshot), select your desired content type (4), and execute the request (5).



The most important properties right now are the state (2) and verdict (3) properties which say if the SUT creation was finished and if it was successful. The A.Result also contains a backward link to its associated A.Request (1). The A.Result will look something like 1 this.

```
Details
Code
200
             Response body
                    <oslc_auto:contribution>
                      <oslc_auto:Contribution>
                        <oslc:valueType rdf:resource="http://localhost:8081/compilation/services/resourceShapes/sUT"/>
                        <dcterms:title rdf:parseType="Literal">SUT</dcterms:title>
                        <dcterms:description rdf:parseType="Literal">Created SUT resource. Also linked to by the
              createdSUT property.</dcterms:description>
                        <rdf:value>http://localhost:8081/compilation/services/resources/sUTs/1</rdf:value>
                      </oslc_auto:Contribution>
                    </oslc auto:contribution>
                    <dcterms:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"</pre>
                  >2021-04-26T14:03:17.968Z</dcterms:modified>
                    <oslc_auto:state rdf:resource="http://open-services.net/ns/aut #complete"/>
                    <oslc_auto:inputParameter>
                      <oslc auto:ParameterInstance>
                        <rdf:value>gcc -g TestEchoProgram.cpp -o my_echo</rdf:value>
                        <oslc:name>buildCommand</oslc:name>
                      </oslc_auto:ParameterInstance>
                    </oslc auto:inputParameter>
                    <oslc auto:outputParameter>
                      <oslc auto:ParameterInstance>
                        <rdf:value>false</rdf:value>
                        <oslc:name>unpackZip</oslc:name>
                      </oslc_auto:ParameterInstance>
                    </oslc_auto:outputParameter>
                    <dcterms:identifier>1</dcterms:identifier>
                                                                                                                 Download
                    <oslc_auto:verdict rdf:resource="http://open-services.net/ns/aut passed"/>
```

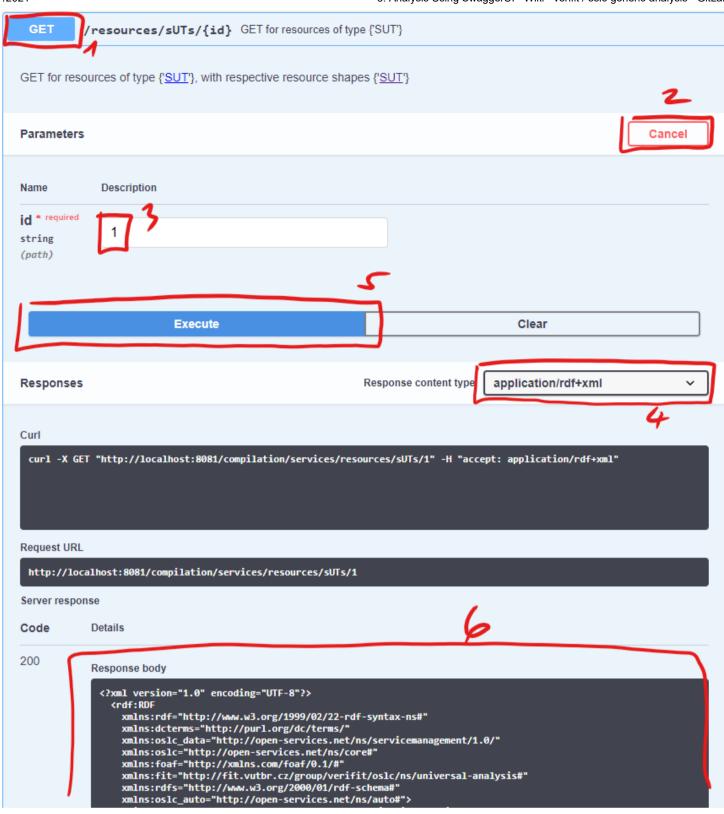
The A.Result will contain logs of the SUT creation process.

And most importantly the A.Result will contain a link to the createdSUT

```
Details
Code
200
            Response body
                      <oslc_auto:Contribution>
             </dcterms:description>
                        <rdf:value>
                        </rdf:value>
                      </oslc_auto:Contribution>
                    </oslc_auto:contribution>
                    <oslc_auto:contribution>
                      <oslc_auto:Contribution>
                        <fit:filePath>C:\power42\matrix\universal-analysis-
              adapter\compilation\SUT\1\.adapter\stderr_compilation_1</fit:filePath>

<
                        <rdf:value>
                       </rdf:value>
                     </oslc_auto:Contribution>
                    </oslc auto:contribution>
                   <fit:createdSUT rdf:resource="http://localhost:8081/compilation/services/resources/sUTs/1"/>
                    <oslc_auto:outputParameter>
                      <oslc_auto:ParameterInstance>
                                                                                                               Download
                        <rdf:value>true</rdf:value>
```

To retrieve the created SUT resource navigate to the <u>SUT GET capability</u> (or <u>alt</u>) (1), click (2), set the ID based on the cretedSUT property from the last screenshot (3), pick your content type (4), execute the request (5), and look at the SUT resource in the received response (6).

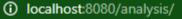


The SUT resource will have a URI (1) which needs to be remembered by the client in order to be used as an input parameter when requesting analysis. It will have properties which are then used by the analysis adapter such as the build command (2) and the launch command (4), a compilation flag (3), and a directory (5). The SUT resource will look something like 1 this.

```
Details
Code
200
              Response body
               <?xml version="1.0" encoding="UTF-8"?>
                  <rdf:RDF
                    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
                    xmlns:dcterms="http://purl.org/dc/terms/
                    xmlns:oslc_data="http://open-services.net/ns/servicemanagement/1.0/"
                    xmlns:oslc="http://open-services.net/ns/core#"
                    xmlns:foaf="http://xmlns.com/foaf/0.1/#"
                    xmlns:fit="http://fit.vutbr.cz/group/verifit/oslc/ns/universal-analysis#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
                    xmlns:oslc_auto="http://open-services.net/ns/auto#">
<fit:SUT rdf:about="http://localhost:8081/compilation/services/resources/sUT//1">
                      <fit:buildCommand !!f:parseType="Literal">gcc -g TestEchoProgram.cpp -o my_echo</fit:buildCommand>
                      <dcterms:created rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"</pre>
                    >2021-04-26T14:03:17.856Z</dcterms:created>
                     <oslc_auto:producedByAutomationRequest</pre>
               rdf:resource="http://localhost:8081/compilation/services/resources/automationRequests/1"/>
                      <fit:compiled raf:datatype="http://www.w3.org/2001/XMLSchema#boolean"</pre>
                    >true</fit:compiled>
                      <dcterms:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"</pre>
                    >2021-04-26T14:03:17.856Z</dcterms:modified>
                      <fit:launchCommand | tr:parseType="Literal">./my_echo</fit:launchCommand>
                      <fit:SUTdirectoryPath rdf:parseType="Literal">C:\power42\matrix\universal-analysis-
               adapter\compilation\SUT\1</fit:SUTdirectoryPath>
                      <dcterms:title rdf:parseType="Literal">SUT - First prototype request</dcterms:title>
                                                                                                                          Download
```

## 2) Execute Analysis

Open the Analysis adapter home page. And navigate to the swagger UI.





# VeriFit Analysis

This is a homepage of the *VeriFit Analysis* that was generated using Eclipse Lyo Toolchain Designer.

#### **Service Provider Catalog**

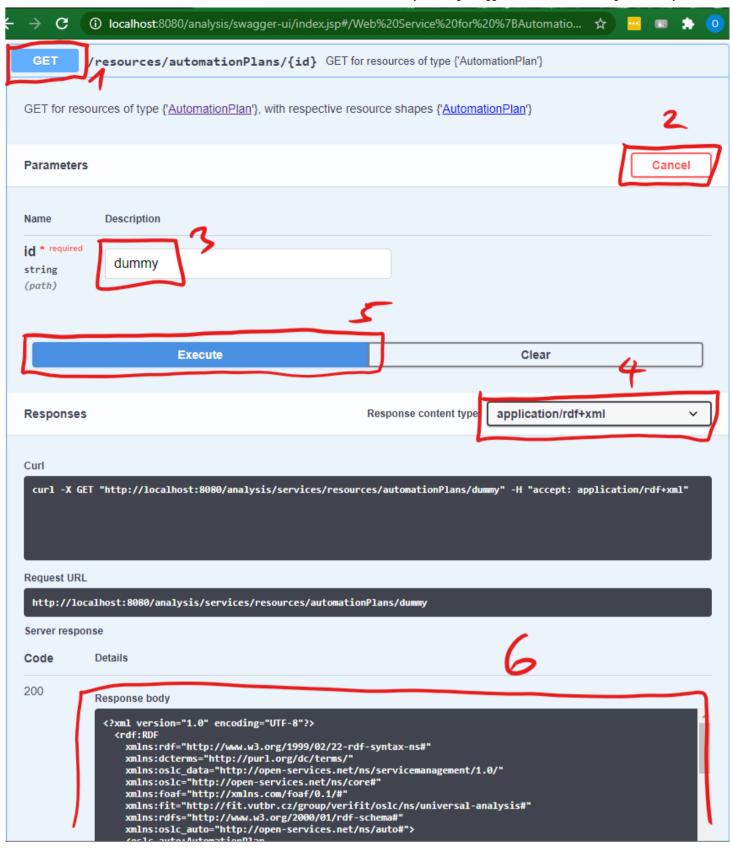
Start from the Service Provider Catalog, to navigate your adaptor's services and resources, using the available Query capabilities, Selection and Creation Dialogs. Note that these are end-user HTML pages, which is very useful for debugging your adaptor.



Use Swagger UI To interact with the adaptor services dedicated for RDF.

You can also copy this OpenAPI specification document (yaml file) of this adaptor to a Swagger Editor to generate client SDK code for a number of languages and platforms.

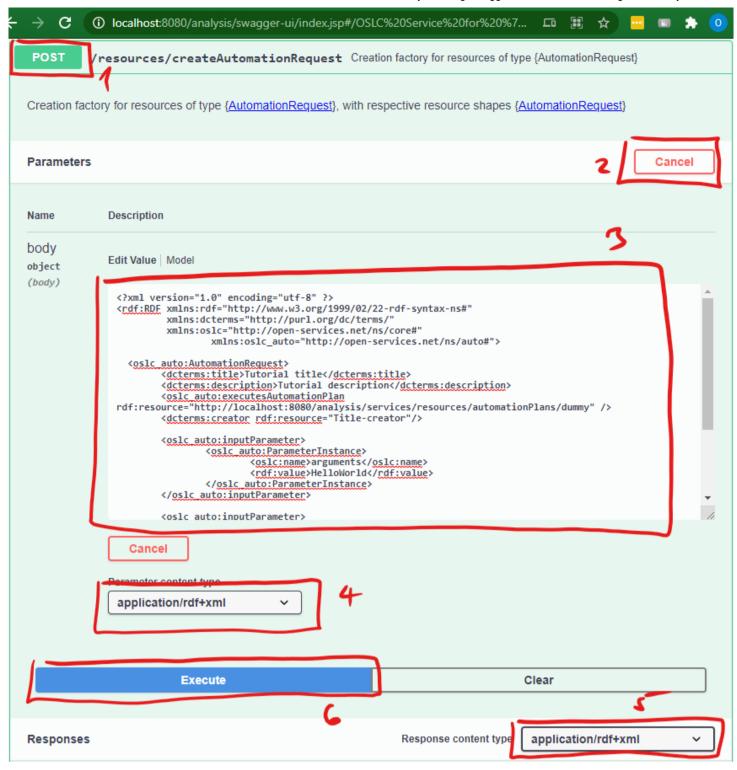
Find and expand the <u>Automation Plan GET</u> (or <u>alt</u>) capability (1) and click the "try it out" button (2). Set the ID to the ID of your analysis tool (3) and pick your desired content type (4). Execute the request (5) and then look at the result (6) to learn about input parameters accepted by the Automation Plan which are defined using ParameterDefinition properties. The Automation Plan will look something like <u>1</u> this



Parameter Definitions will match the ones defined by your for the analysis tool (e.g. 1) and there will be common adapter input parameters as well (e.g. 2).

```
Code
            Details
200
            Response body
                    <oslc_auto:parameterDefinition>
                      <oslc_auto:ParameterDefinition>
                        <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
                        <oslc:occurs rdf:resource="http://open-services.net/ns/core#Exactly-one"/>
                        <fit:valuePrefix>--args=</fit:valuePrefix>
                        <fit:commandlinePosition rdf:datatype="http://www.w3.org/2001/XMLSchema#int"</pre>
                      >1</fit:commandlinePosition>
                        <dcterms:description rdf:parseType="Literal">Specify which arguments should be passed to the
              command line.</dcterms:description>
                        <oslc:name arguments /oslc:name>
                      </oslc_auto:Parametervefinition>
                    </oslc_auto:parameterDefinition>
                    <oslc_auto:parameterDefinition>
                      <oslc_auto:ParameterDefinition>
                        <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
                        <oslc:occurs rdf:resource="http://open-services.net/ns/core#Zero-or-One"/>
                        <dcterms:description rdf:parseType="Literal">A command to run just before analysis is executed.
              </dcterms:description>
                        <oslc:name beforeCommand</pre>
                      </oslc_auto:ParameterDefinition>
                    </oslc_auto:parameterDefinition>
                    <oslc_auto:parameterDefinition>
                      <oslc_auto:ParameterDefinition>
                        <oslc:occurs rdf:resource="http://open-services.net/ns/core#Zero-or-One"/>
                        <fit:commandlinePosition rdf:datatype="http://www.w3.org/2001/XMLSchema#int"</pre>
                      >2</fit:commandlinePosition>
                        <dcterms:description rdf:parseType="Literal">This parameter definitions tells the Autom Download
              Plan to place the SUT launch command at this command line position</dcterms:description>
```

Next find and expand the <u>Automation Request POST</u> capability (1) and again click "try it out" (2). Paste your Automation Request into the input box (3), set the content type of the request body (4), select your desired content type (5), and execute the request (6). The Automation Request needs to contain input parameters base on the executed Automation Plan and have a link to the executed Automation Plan. Input parameters in our case are a link to an SUT resource to be analysed and arguments for the analysis tool. Try this <u>a example request</u>



The response to your request will look something like <u>this</u>. The created Automation Request will have a URI with a numerical ID at the end (1). And its most important property for us now is a link to the producedAutomationResult (3). Other important properties include the desired state (2), state (4), and your input parameters (5). Notice that the numberical ID of the A.Result is the same as of the A.Request this can be used as a shorcut for finding A.Results.

```
Details
Code
201
              Response body
                rdf:about="http://localhost:8080/analysis/services/resources/automationRequests/1"
                      <coslc_auto:desiredState rdf:resource="http://open-services.net/ns/auto*complete"/>
<dcterms:created rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"</pre>
                    >2021-04-26T16:05:01.341Z</dcterms:created>
                     <oslc auto:executesAutomationPlan</pre>
               rdf:resource="http://localhost:8080/analysis/services/resources/automationPlans/dummy"/>
                      <oslc_auto:inputParameter>
                        <oslc_auto:ParameterInstance>
                          <rdf:value>HelloWorld</rdf:value>
                          <oslc:name>arguments</oslc:name>
                        </oslc_auto:ParameterInstance>
                      </oslc_auto:inputParameter>
                      <dcterms:description rdf:parseType="Literal">Tutorial description</dcterms:description>
                      <dcterms:identifier>1</dcterms:identifier>
                      <oslc_auto:inputParameter>
                          <rdf:value>http://localhost:8081/compilation/services/resources/sUTs/1</rdf:value>
                          <oslc:name>SUT</oslc:name>
                        </oslc_auto:ParameterInstance>
                      </oslc_auto:inputParameter>
                      <dcterms:title rdf:parseType="Literal">Tutorial title</dcterms:title>
                      <dcterms:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"</pre>
                    >2021-04-26T16:05:01.341Z</dcterms:modified>
                      <dcterms:creator rdf:resource="file:///C:/power42/matrix/universal-analysis-adapter/analysis/Title-</pre>
               creator"/>
                      <oslc_auto:producedAutomationResult</pre>
               rdf:resource="http://localhost:8080/analysis/services/resources/automationResults/1",>
                     <oslc_auto:state rdf:resource="http://open-services.net/ns/autofinProgress"/>
```

Now find and expand the <u>Automation Result GET</u> (or <u>alt</u>) capability (1) and again click "try it out" (2). Set the ID to match the ID of your Automation Result (3) (from the producedAutomationResult property in the previous screenshot), select your desired content type (4), and execute the request (5). The result will be shown in (6).

The A.Result will look something like <u>1</u> this. The most important properties right now are the state (5) and verdict (1) properties which say if the SUT creation was finished and if it was successful. Other important properties are output parameters which inform the client about parameters the adapter used on its own with default values (4). There will

be status messages from the adapter about the execution process (2), standard output logs of the analysis (6, 7), return code of the analysis (3), and potential other contributions depending on the tool and the input parameters used.

# 3) Links to example files for quick access

#### Compilation / SUT creation

- <u>Automation Plan GET response</u>
- <u>Automation Request POST</u>
- <u>Automation Request POST response</u>
- <u>Automation Result GET response</u>
- <u>SUT GET response.</u>

#### Analysis

- <u>Automation Plan GET response</u>
- <u>Automation Request POST</u>
- <u>Automation Request POST response</u>
- <u>Automation Result GET response</u>