FORUMSYSTEMS™

MANAGING & ACCELERATING XML WEB SERVICES SECURITY

FORUM SYSTEMS HANDS-ON TRAINING

LAB 16. INTEGRATION – REST TO SOAP CONVERSION

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Forum Systems Hands-on Training – Lab 16. Integration – REST to SOAP Conversion
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Introduction

Lab 16. Integration – REST to SOAP Conversion

Skill Level

This lab is Advanced Skill Level. A working knowledge of the Forum Sentry and SOAPSonar products OR completion of the Beginner and Intermediate labs is assumed. With the Advanced labs there will be fewer screen shots and specific instructions. Instead, general use case requirements and guidelines are provided and the user will need to build policies with minimal assistance from the Training staff.

Prerequisites

This lab requires the Forum Sentry Training Image, with a licensed copy Sentry and SOAPSonar.

Refer to the “FS_Training_Labs_v8-1_Introduction” document for information on the Forum Sentry Training Image and licensing SOAPSonar Enterprise Edition.

Experience building Sentry WSDL Policies and Task Lists in Forum Sentry is required.

As this is an advanced level lab, fewer step by step instructions and screen shots will be provided.

Lab Overview

REST to SOAP conversion is a common Forum Sentry use case and is quite easily configured with Sentry's point and click interface. No coding or XSLT is required to enable this conversion.

This lab details the steps to configure a Sentry policy that will accept either a SOAP request or a REST call on the same URI for the same remote SOAP API.

The WSDL Policy built in this lab will provide a single endpoint that will accept either a SOAP request or a REST GET request with data in the URL query parameters. Sentry will consume either request format, convert if necessary, and then send a SOAP request to the public W3Schools Online Temperature Conversion SOAP API. Depending on the format of the request, Sentry will return to the client either a SOAP response (if a SOAP request) or a JSON response (if a REST request).

In this lab you will build a WSDL Policy and several Task Lists to accomplish the aforementioned use case.

This lab will provide instructions for REST to SOAP conversion in Forum Sentry. Topics will include:

1. WSDL Policies
2. Message Type Filters
3. Task Lists
4. JSON Messages

Sentry Policy Configuration

Note that there are multiple ways to build REST to SOAP conversion policies in Sentry. The correct approach depends on the complexity of the SOAP API, the request formats, etc. This configuration is an example of a simple REST query string to SOAP and SOAP to JSON conversion. These steps may not be applicable for all SOAP to REST conversion use cases.

In this step you'll build a WSDL Policy in Sentry for the W3Schools Temperature Conversion SOAP Service.

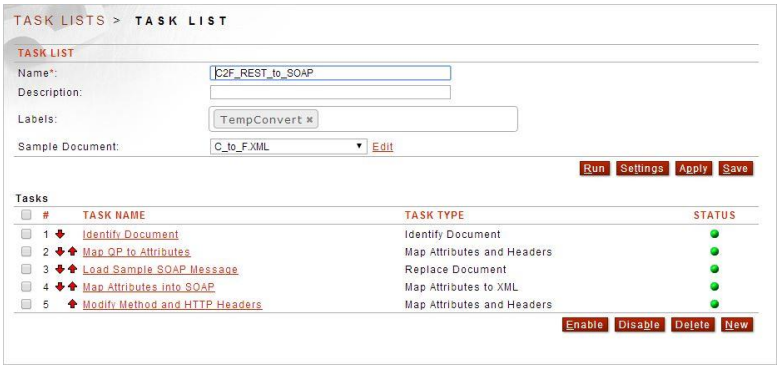
Building the Sentry Configuration

Follow the outline below to build the Sentry configuration.

1. Build a WSDL Policy using the WSDL for the temp convert service: https://www.w3schools.com/xml/tempconvert.asmx?WSDL
2. Enable Response Processing on the associated HTTP Remote Policy.
3. Modify the Virtual Directory of the WSDL Policy specifying the following criteria:
    a. Filter Expression: .*
    b. Enable WSDL Access
    c. Add a new Message Type filter using the Simple format and the following Identification Expression:

```
(method == "GET") || (method == "POST") || (method == "PUT") || (method == "DELETE")
```

4. Test the WSDL Policy to ensure that the service using SOAP on both sides is functional
5. Build the appropriate task lists to convert the REST calls to SOAP and convert SOAP responses to JSON format. There will be a total of 4 task lists built for this use case, 2 for each web service operation (1 for request, 1 for response). These instructions won't show the full step by step for building the task lists, but instead a general overview.
    a. Task List 1 - To convert Celsius to Fahrenheit REST requests to SOAP format
        Task 1: Identify Document - Checks to see if Celsius query parameter exists in the request
        Task 2: Maps the Celsius query parameter value to a user attribute
        Task 3: Loads a sample Celsius to Fahrenheit SOAP request
        Task 4: Maps the Celsius user attribute into the new SOAP message
        Task 5: Modifies the HTTP headers and Method for the SOAP API (sets SOAPAction, Content-Type, and changes method to POST)



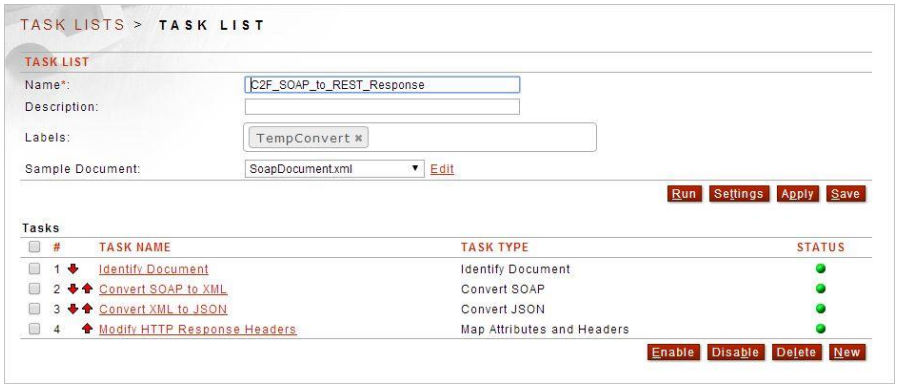
b. Task List 2 - To convert Celsius to Fahrenheit SOAP responses to JSON format

Task 1: Identify Document - Checks to see if Fahrenheit query parameter exists in the request

Task 2: Converts the SOAP message to XML

Task 3: Converts the XML to JSON

Task 4: Modifies the HTTP response headers - changes the Content-Type to application/json



c. Task List 3 - To convert Fahrenheit to Celsius REST requests to SOAP format.

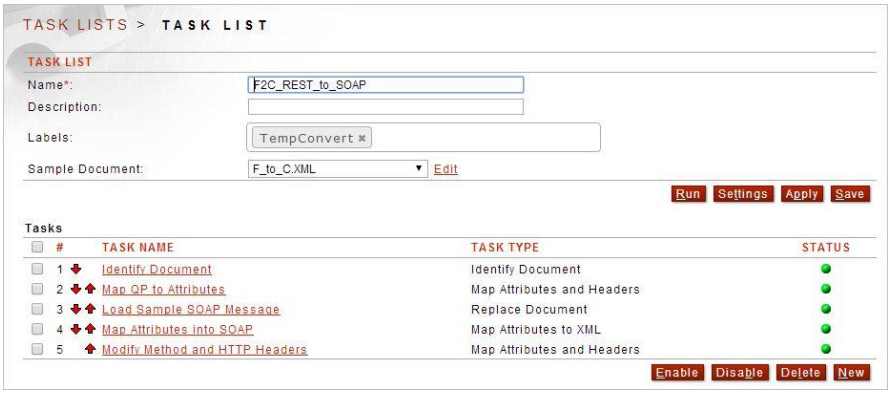
Task 1: Identify Document - Checks to see if Fahrenheit query parameter exists in the request

Task 2: Maps the Fahrenheit query parameter value to a user attribute

Task 3: Loads a sample Fahrenheit to Celsius SOAP request

Task 4: Maps the Fahrenheit user attribute into the new SOAP message

Task 5: Modifies the HTTP headers and Method for the SOAP API (sets SOAPAction, Content-Type, and changes method to POST)



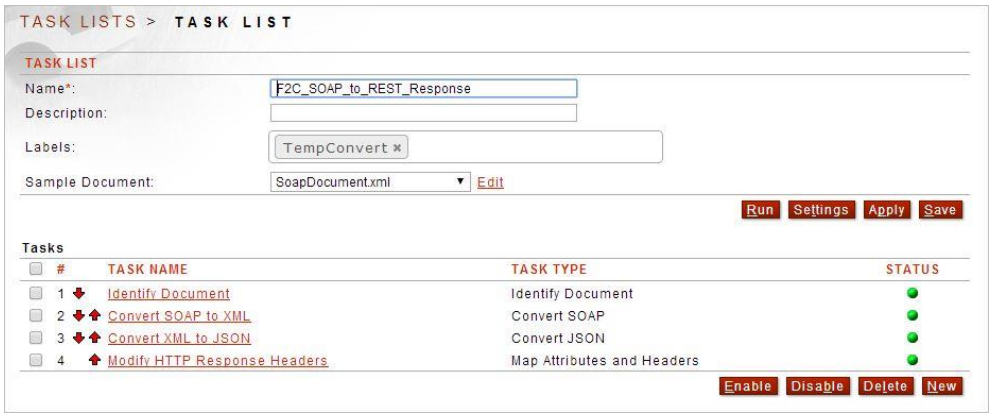
d. Task List 4 - To convert Fahrenheit to Celsius SOAP responses to JSON format

Task 1: Identify Document - Checks to see if Celsius query parameter exists in the request

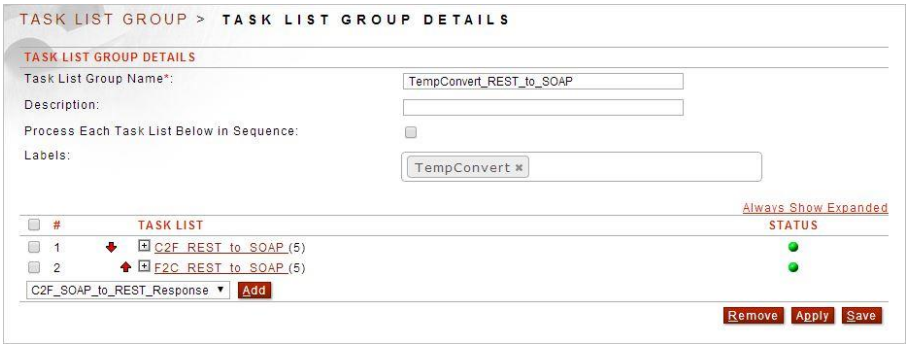
Task 2: Converts the SOAP message to XML

Task 3: Converts the XML to JSON

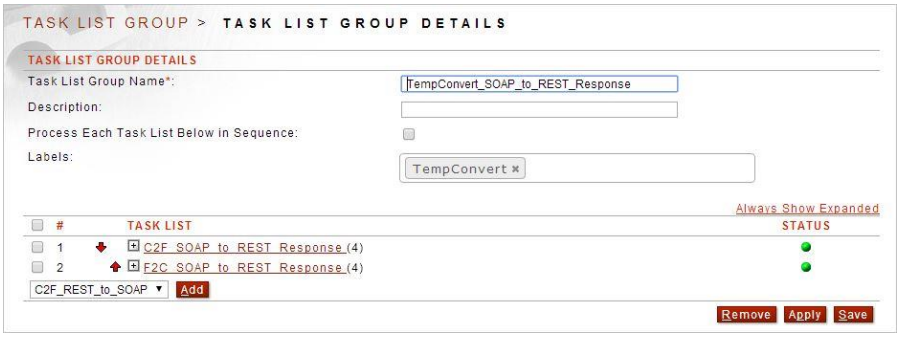
Task 4: Modifies the HTTP response headers - changes the Content-Type to application/json



6. Create two task list groups to combine the two request task lists and the two response task lists.
    a. Request Task List Group



    b. Response Task List Group



7. Associate the Task List Groups to the WSDL Policy. This is the final step that will enable the REST to SOAP and SOAP to JSON conversions.

Test the REST to SOAP Conversion

With this single API endpoint in Sentry, you can now send in either a SOAP request or an HTTP GET with query parameter values for temperature conversion.

Use SOAPSonar for testing the new WSDL Policy. Send in both SOAP requests – which should return a SOAP response, and HTTP GET requests (REST test case) that should return a JSON response.

Sample SOAP Requests

Celsius to Fahrenheit:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
<soap:Body>
<tns:CelsiusToFahrenheit xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.w3schools.com/webservices/">
<tns:Celsius>26</tns:Celsius>
</tns:CelsiusToFahrenheit>
</soap:Body>
</soap:Envelope>
```

Fahrenheit to Celsius:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
<soap:Body>
<tns:FahrenheitToCelsius xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.w3schools.com/webservices/">
<tns:Fahrenheit>72</tns:Fahrenheit>
</tns:FahrenheitToCelsius>
</soap:Body>
</soap:Envelope>
```

Sample REST GET URLs

Celsius to Fahrenheit:

http://SENTRY_LISTENER_IP:PORT/webservices/tempconvert.asmx?Celsius=20

Fahrenheit to Celsius:

http://SENTRY_LISTENER_IP:PORT/webservices/tempconvert.asmx?Fahrenheit=80

END

Additional Testing and More Reading

BACK IT UP!

It is recommended that you export your WSDL Policy and/or your full Sentry configuration after completing this lab.

To export the WSDL policy, navigate to the WSDL Policies page, select the WSDL policy and use the GDM Export option to export the policy (and all dependencies) as a password encrypted FSG file. This can later be imported on the System→Configuration→Import/Export screen.

To export your full Sentry configuration, navigate to the System→Configuration→Import/Export screen and use the Export option in the center of the page to export the full Sentry configuration file as a password encrypted FSX file. This can later be imported on the same screen.

Backup your SOAPSonar project file by using the File→Save As option. All of your test cases will be saved in an .SSP file.

We recommend including the lab number in the name of the export files.

Additional Tests and Discussion Topics

1. Add SSL with mutual authentication to the policy.
2. Add Password Authentication with HTTP Cookie SSO to the policy.
3. What happens if you don't provide the correct query parameters in the REST call?

Additional Information

For more information, review the following Forum Sentry Admin Guide:

1. WSDL Policies Guide
2. Helpdesk guide with more instructions and sample FSG:
   https://helpdesk.forumsys.com/entries/97612223-How-To-REST-to-SOAP-Conversion

About Forum Systems

Forum Systems is the global leader in API and Cloud Security technology with industry-certified, patented, and proven products deployed in the most rigorous and demanding customer environments worldwide. Forum Systems has been an industry leader for over 12 years and has built the core architecture of its technology on the foundation of FIPS 140-2 and NDPP. Forum Systems security-first mindset enables trusted, network edge deployments of its technology for protecting critical enterprise transactions.

Our product technology is purpose-built and designed for mission-critical, enterprise-class scalable solutions where business solutions require the modern day security and identity enforcement protection, while enabling a scalable architecture and low-latency, high-volume throughput.

Forum Systems supports global enterprise customers across industries in commercial, government, and military sectors. Forum Systems technology provides the leading-edge of modern-day cyber-security innovation with integrated identity and SSO features that enable out-of-the box business solutions with point-and-click technology.

Forum's patented; FIPS 140-2 and NDPP certified hardware and virtual products make modern-day business communications secure by actively protecting and accelerating data exchange and API service access across networks and business boundaries. For more information, please visit www.forumsys.com.