About the Tutorial

SoapUI is an open-source tool used for functional and non-functional testing, widely used in WebServices testing. This is a brief tutorial that introduces the readers to the basic features and usage of SoapUI. The tutorial will guide the users on how to utilize the tool in WebService and other non-functional testing.

Audience

This tutorial has been prepared for beginners to help them understand how to use the SOAPUI tool.

Prerequisites

As a reader of this tutorial, you should have a basic understanding of the client/server environment, and knowledge of SOAP, WSDL, XML, and XML namespace.

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1. SOAP – Introduction

SOAP is the acronym for Simple Object Access Protocol. It is defined by World Wide Web Consortium (W3C) at [http://www.w3.org/TR/2000/NOTE-SOAP-20000508](http://www.w3.org/TR/2000/NOTE-SOAP-20000508) as follows:

SOAP is a lightweight protocol for the exchange of information in a decentralized, distributed environment. It is an XML based protocol that consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it; a set of encoding rules for expressing instances of application-defined data types; and a convention for representing remote procedure calls and responses.

**SOAP – Important Features**

Following are some important features of SOAP.

- It is a communication protocol designed to communicate via Internet.
- It can extend HTTP for XML messaging.
- It provides data transport for Web services.
- It can exchange complete documents or call a remote procedure.
- It can be used for broadcasting a message.
- It is both platform and language independent.
- It is the XML way of defining what information is sent and how.
- It enables client applications to easily connect to remote services and invoke remote methods.

Although SOAP can be used in a variety of messaging systems and can be delivered via a variety of transport protocols, the initial focus of SOAP is remote procedure calls transported via HTTP. Other frameworks such as CORBA, DCOM, and Java RMI provide similar functionality to SOAP, but SOAP messages are written entirely in XML and are therefore uniquely platform- and language-independent.
A SOAP message is an ordinary XML document containing the following elements:

- **Envelope**: Defines the start and the end of the message. It is a mandatory element.
- **Header**: Contains any optional attributes of the message used in processing the message, either at an intermediary point or at the ultimate end-point. It is an optional element.
- **Body**: Contains the XML data comprising the message being sent. It is a mandatory element.
- **Fault**: An optional Fault element that provides information about errors that occur while processing the message.

All these elements are declared in the default namespace for the SOAP envelope:

```
http://www.w3.org/2001/12/soap-envelope
```

The default namespace for SOAP encoding and data types is:

```
http://www.w3.org/2001/12/soap-encoding
```

**Note**: All these specifications are subject to change. Thus, keep updating yourself with the latest specifications available on the W3 website.

## SOAP – Message Structure

The following block depicts the general structure of a SOAP message:

```xml
<?xml version="1.0"?>
<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://www.w3.org/2001/12/soap-envelope"
SOAP-ENV:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<SOAP-ENV:Header>
...
...
</SOAP-ENV:Header>

<SOAP-ENV:Body>
...
...
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```
...  
...  
</SOAP-ENV:Fault>

</SOAP-ENV:Body>

</SOAP_ENV:Envelope>
3. **SOAP – What is REST?**

REST is the acronym for Representational State Transfer. It can be defined as an architectural style of designing softwares. REST is not a specification or W3C standard. Hence, it is easier to work with RESTful Services. It doesn’t require any middleware specification framework.

**REST – Important Features**

Following are some important features of REST.

- It relies on stateless, client-server, cacheable communication protocol – virtually in all cases, HTTP is used.

- It is light-weighted alternative of WebService and RPC (Remote Procedure Call) like SOAP-WSDL.

- It represents everything in unique ID or URIs.

- It makes the use of standard HTTP methods, such as GET, POST, PUT, DELETE.

- It links sources together.

- REST resources could have multiple representations.

- Any named information is considered as a Resource. For example: An image, a person, a document, all can be considered as an example of resource and represented as a unique ID or a URI.

- World Wide Web itself, based on HTTP, can be viewed as REST based architecture.

REST services are Platform and Language independent. Since it is based on HTTP standards, it can easily work in the presence of firewalls. Like WebServices, REST doesn’t offer any in-built security, session management, QoS guarantee but these can be added by building on top of HTTP. For encryption, REST can be used on top of HTTPS.
SoapUI is a tool which can be used for both functional and non-functional testing. It is not limited to web services, though it is the de-facto tool used in web services testing.

**SoapUI — Important Features**

Following are some important features of SoapUI.

- It is capable of performing the role of both client and service.
- It enables the users to create functional and non-functional tests quickly and in an efficient manner using a single environment.
- It is licensed under the terms of the GNU Leaser General Public Licence (LGPL).
- It is purely implemented using JAVA platform.
- It supports Windows, Mac, multiple Linux dialects.
- It allows testers to execute automated functional, regression, compliance, and load tests on different Web API.
- It supports all the standard protocols and technologies to test all kinds of APIs.

SOAP UI can be used to test complete RESTful API and SOAP Web Service testing. It supports Functional Testing, Performance Testing, Interoperability Testing, Regression Testing, Load Testing, and much more.

It is user friendly as well as it is easy to convert functional test into non-functional tests such as Load, Stress testing.
5. **SoapUI – Capabilities**

**SOAP UI is rich in the following five aspects:**

- Functional Testing
- Security Testing
- Load Testing
- Protocols and Technologies
- Integration with other tools

Let’s learn more about each of these capabilities.

**Functional Testing**

- SOAP UI allows the testers to write functional API tests in SOAP UI.
- SOAP UI supports Drag-Drop feature that accelerates the script development.
- SOAP UI supports debugging of tests and allows testers to develop data driven tests.
- SOAP UI supports multiple environments making it easy to switch among QA, Dev, and Prod environments.
- SOAP UI allows advanced scripting (the tester can develop their custom code depending on the scenarios).

**Security Testing**

- SOAP UI performs a complete set of vulnerability scan.
- SOAP UI prevents SQL Injection to secure the databases.
- SOAP UI scans for stack overflows, caused by documents huge in size.
- SOAP UI scans for cross-site scripting, which occurs when service parameters are exposed in messages.
- SOAP UI performs fuzzing scan and boundary scan to avoid erratic behavior of the services.

**Load Testing**

- SOAP UI distributes the load tests across n number of LoadUI agents.
- SOAP UI simulates high volume and real-world load testing with ease.
- SOAP UI allows advanced custom reporting to capture performance parameters.
• SOAP UI allows end-to-end system performance monitoring.

Protocols & Technologies
SOAP UI supports a wide range of protocols:

• SOAP – Simple Object Access Protocol
• WSDL – Web Service Definition Language
• REST – Representational State Transfer
• HTTP – Hyper Text Transmission Protocol
• HTTPS – Hyper Text Transmission Protocol Secured
• AMF – Action Message Format
• JDBC – Java Database Connectivity
• JMS – Java Messaging Service

Integration with Other Tools
• Apache Maven Project
• HUDSON
• JUnit
• Apache – Ant and more....
6. SoapUI – NG Pro

SOAP UI is an open source free version tool with basic features of testing, while SOAP UI NG Pro is a commercialized tool having advanced features of reporting, data-driven functionality and much more.

Comparison

The following table compares and contrasts the various features of SoapUI and SoapUI NG Pro.

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<th>SoapUI NG Pro</th>
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<td>Yes</td>
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<td>WSDL/WADL</td>
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<td>Yes</td>
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<td>REST</td>
<td>Yes</td>
<td>Yes</td>
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<td>JMS</td>
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<td>Yes</td>
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<td>AMF</td>
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<td>Yes</td>
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<tr>
<td>JDBC</td>
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<td>Yes</td>
</tr>
<tr>
<td>HTTP</td>
<td>Yes</td>
<td>Yes</td>
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<td><strong>General Features</strong></td>
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<td>Standalone Application</td>
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<td>Yes</td>
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<tr>
<td>Multi Environment Support</td>
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</tr>
<tr>
<td>Floating Licence</td>
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<td>Yes</td>
</tr>
<tr>
<td>WSDL Coverage</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Request/Response Coverage</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Message Assertion</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Test Refactoring</td>
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<td>Yes</td>
</tr>
<tr>
<td>Running multiple tests</td>
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<td>Yes</td>
</tr>
<tr>
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<td>Yes</td>
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<tr>
<td>Scripting Libraries</td>
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<td>Yes</td>
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<td>No</td>
<td>Yes</td>
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7. SoapUI – Installation & Configuration

SoapUI is a cross-platform tool. It supports Windows, Linux, and Mac operating systems.

Prerequisites
- **Processor**: 1GHz or higher 32-bit or 64-bit processor.
- **RAM**: 512MB of RAM.
- **Hard Disk Space**: Minimum 200MB of hard disk space for installation.
- **Operating System Version**: Windows XP or later, MAC OS 10.4 or later.
- **JAVA**: JAVA 6 or later.

Download Process
**Step 1**: Go to [https://www.soapui.org/](https://www.soapui.org/) and click Download SOAP UI.
Step 2: Click ‘Get It’ to download SOAP UI Open Source. It will start downloading 112MB .exe file in the system. Wait till the download process is complete.
End of ebook preview

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