

STML: Service Type-Checking Markup Language for Services of Web Components

Authors : Saqib Rasool, Adnan N. Mian

Abstract : Web components are introduced as the latest standard of HTML5 for writing modular web interfaces for ensuring maintainability through the isolated scope of web components. Reusability can also be achieved by sharing plug-and-play web components that can be used as off-the-shelf components by other developers. A web component encapsulates all the required HTML, CSS and JavaScript code as a standalone package which must be imported for integrating a web component within an existing web interface. It is then followed by the integration of web component with the web services for dynamically populating its content. Since web components are reusable as off-the-shelf components, these must be equipped with some mechanism for ensuring their proper integration with web services. The consistency of a service behavior can be verified through type-checking. This is one of the popular solutions for improving the quality of code in many programming languages. However, HTML does not provide type checking as it is a markup language and not a programming language. The contribution of this work is to introduce a new extension of HTML called Service Type-checking Markup Language (STML) for adding support of type checking in HTML for JSON based REST services. STML can be used for defining the expected data types of response from JSON based REST services which will be used for populating the content within HTML elements of a web component. Although JSON has five data types viz. string, number, boolean, object and array but STML is made to supports only string, number and object. This is because of the fact that both object and array are considered as string, when populated in HTML elements. In order to define the data type of any HTML element, developer just needs to add the custom STML attributes of st-string, st-number and st-boolean for string, number and boolean respectively. These all annotations of STML are used by the developer who is writing a web component and it enables the other developers to use automated type-checking for ensuring the proper integration of their REST services with the same web component. Two utilities have been written for developers who are using STML based web components. One of these utilities is used for automated type-checking during the development phase. It uses the browser console for showing the error description if integrated web service is not returning the response with expected data type. The other utility is a Gulp based command line utility for removing the STML attributes before going in production. This ensures the delivery of STML free web pages in the production environment. Both of these utilities have been tested to perform type checking of REST services through STML based web components and results have confirmed the feasibility of evaluating service behavior only through HTML. Currently, STML is designed for automated type-checking of integrated REST services but it can be extended to introduce a complete service testing suite based on HTML only, and it will transform STML from Service Type-checking Markup Language to Service Testing Markup Language.

Keywords : REST, STML, type checking, web component

Conference Title : ICSOC 2017 : International Conference on Service Oriented Computing

Conference Location : Osaka, Japan

Conference Dates : October 09-10, 2017