SpyREST: Automated Example Based Documentation for RESTful Web APIs

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Abstract—Documentation of RESTful APIs are expensive to produce and maintain. It is expensive because there is a lack of reusable tools and automated solutions for RESTful API documentation. Most RESTful APIs are documented manually and the API developers are responsible for keeping an updated documentation as the API evolves making the process both costly and error-prone. In this paper we introduce SpyREST, a reusable tool that can automatically generate RESTful API documentation. SpyREST uses a proxy to intercept example API calls and intelligently produces API documentation for RESTful Web APIs by processing the request and response data. Using SpyREST, RESTful API developers can significantly reduce the cost of producing and maintaining API documentation by replacing a large part of the manual process of documentation with an automated one.

Keywords—*RESTful API, Web API, Documentation, Automation, Example based documentation*

I. INTRODUCTION

RESTful APIs are used as a primary interconnection mechanism among modern day Web based systems. For example, the website of a restaurant can use the RESTful API from Twitter to show the latest tweets mentioning the restaurant so that prospective customers can read the experience shared by others. To allow others to use their APIs, Twitter and other RESTful API developers publish documentation describing different features of their RESTful API. The documentation of such RESTful APIs are commonly produced and maintained using a manual process.

API documentation for library APIs, such as Java Standard Edition, commonly leverage reusable tools such as JavaDoc. The documentation produced by such tools include description of objects and methods, with custom texts primarily sourced via comments. On the other hand, RESTful APIs documentation includes additional information such as HTTP headers, request parameters, request and response data in serialized formats such as JSON, XML that cannot be easily derived from looking at the objects and methods in the source code. Using comments for these additional information also requires significant manual effort because there is a lack of reusable tools to automate the documentation process. This makes the task of RESTful API documentation a costly and error-prone one. In addition to producing the API documentation, API developers also need to publish and often maintain the documentation for multiple versions as the RESTful API evolves. This requires further manual effort because it becomes a continuous process.

To produce RESTful API documentation with information about HTTP headers, URL parameters, request and response data, the manual process is driven by example API calls. Example calls are made and recorded against an API endpoint to gather information for documentation. This process can be described as a six-step process as follows: 1) craft an example call to an API endpoint with required headers, URL parameters and request body, 2) make the call, 3) capture the response headers and data, 4) strip any unwanted data from the captured information, 5) add custom descriptions to the captured data and 6) publish the API documentation. This six-step process is essentially repeated for all API endpoints that are documented.

With SpyREST, we have implemented an innovative solution to largely automate the aforementioned manual process of RESTful API documentation so that all but steps 1 and 5 are automated. Steps 1 and 5 are left to a manual process to allow for a pragmatic solution that leverages computers to automate the repeated part of the process while leaving the rest to humans. Our solution relies on a lightweight HTTP proxy server to intercept example API calls so that all the information about HTTP headers, URL parameters, request and response data can be automatically gathered. The collected data is then processed to present the documentation for RESTful resources under a hierarchy defined by API versions, resources and actions. Sensitive data such as authentication tokens and passwords are automatically filtered and are not captured. Because SpyREST uses a HTTP proxy server, it can generate documentation for all RESTful APIs irrespective of the technology used to implement the API. The resultant is an automated yet customizable, version-aware, collaboration enabled and reusable API documentation software as a service platform that can be used to generate and maintain documentation for any RESTful API.

The implication of SpyREST is two-fold. It helps lower the cost of producing and maintaining RESTful API documentation through automation and provides a shared platform for publishing the documentation of different RESTful APIs.

The remainder of this paper is organized as follows: in the next section we provide background information on the topic of RESTful API and API documentation. Then, we discuss the related work in the following section. The implementation details of SpyREST is provided next. Then, we discuss the implications and limitations of our work in the discussion section. We present our core contributions and future work in the conclusion.

II. Conclusion

The conclusion goes here.

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