

Committee on WIPO Standards (CWS)

Sixth Session
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NEW WIPO STANDARD ON WEB API

Document prepared by the International Bureau

INTRODUCTION

1. At its fifth session held from May 29 to June 2, 2017, the Committee on WIPO Standards (CWS) discussed the need of recommendations for web services on IP information and documentation based on the results of discussions by XML4IP Task Force. Several delegations shared their experience and plans regarding web services. (See paragraphs 89 to 90 of document CWS/5/22).

2. At the meeting, the CWS agreed on the creation of Task No. 56, the description of which is reproduced below and assigned the new Task No. 56 to the XML4IP Task Force:

“Prepare recommendations for data exchange supporting machine to machine communications focusing on:

- (i) message format, data structure and data dictionary in JSON and/or XML; and
- (ii) naming conventions for Uniform Resource Identifier (URI) of resources.”

(See paragraphs 91 to 93 of document CWS/5/22).

3. The International Bureau of WIPO organized the Meeting of Intellectual Property Offices (IPOs) on ICT Strategies and Artificial Intelligence (AI) for IP Administration held in May 2018. Discussions at the meeting were based on document WIPO/IP/ITAI/GE/18/3, which is available at: http://www.wipo.int/meetings/en/details.jsp?meeting_id=46586, containing 40 Recommendations. For information, two application programming interface (API)-related Recommendations, i.e., R38 and R39, are reproduced below.

R38. Improved methods should be explored for integration with international systems and for centralized systems. Create a centralized service, as a demonstration/prototype, with open and standard APIs, for dissemination of classification and standards data and for transactional data exchange between IPOs and regional/international IP systems.

R39. Share information about online services (filing, subsequent transactions, etc) with the aim of identifying common transactions and services that could be made available through APIs to enable interoperability of systems, including systems developed by third party solution providers.

4. At the meeting mentioned above, the delegations noted that many IPOs already use APIs and plan to provide more of their services through APIs. The delegations also recognized that the consistency of APIs across IP offices is important for the efficiency of data exchange, in particular for third party patent management system providers who will unlikely see a business case in supporting different standards for each Office. The delegations were informed that the XML4IP Task Force was working on new recommendations on Web API and agreed to actively participate in the CWS Task Force to prepare a final proposal for a new WIPO standard on APIs for consideration and adoption at this session of the Committee. (See document WIPO/IP/ITAI/GE/18/5.)

WORKING DRAFT OF THE NEW STANDARD

5. In order to carry out Task No. 56, the XML4IP Task Force had four rounds of discussions through its e-forum Wiki, several online conferences and a meeting in person held in Moscow in May 2018. The Task Force also updated the working draft several times and the last working draft, version 0.7, is reproduced as the Annex to the present document for information, which is available only in English.

Objective of Standard

6. The Task Force agreed that the standard aims to provide recommendations on API to facilitate the processing and exchange of IP data in a harmonized way over the Web.

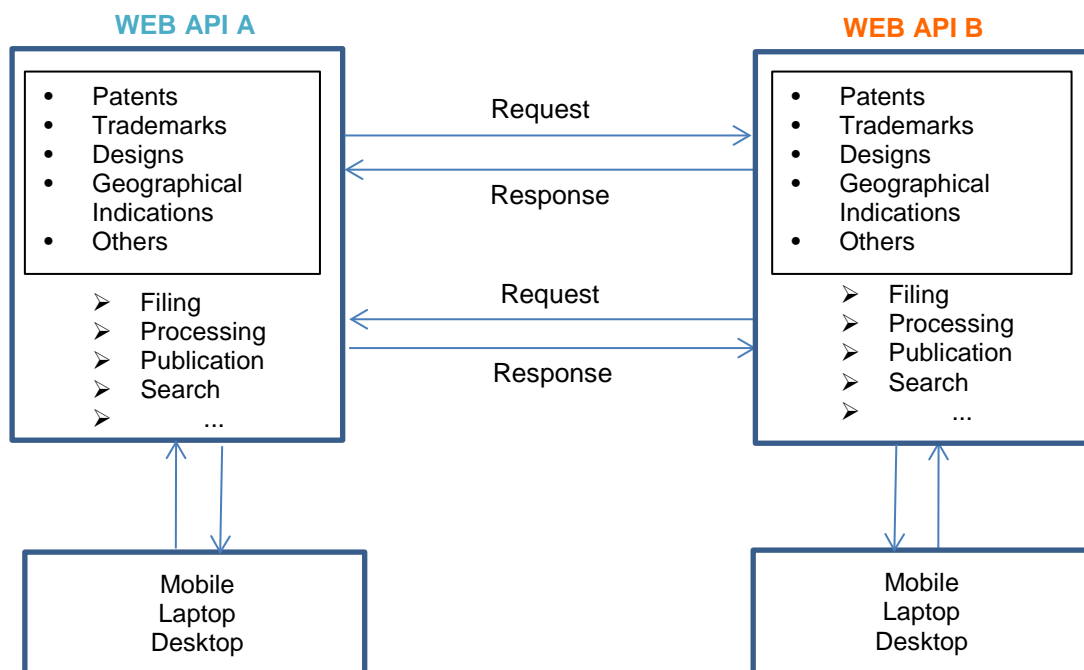
7. The Task Force also agreed that the standard should be intended to:

- ensure consistency by establishing uniform web service design principles;
- improve data interoperability among web service partners;
- encourage reusability through unified design;
- promote data naming flexibility across business units through a clearly defined namespace policy in associated XML resources;
- promote secure information exchange;
- offer appropriate internal business processes as value-added services that can be used by other organizations;
- integrate its internal business processes and dynamically link them with business partners.

Scope of Standard

8. The Task Force considers that the standard should provide guidance to the IPOs and other Organizations that need to manage, store, process, exchange and disseminate IP data using Web APIs. By using this standard, the development of Web APIs can be simplified and accelerated in a harmonized manner and interoperability among Web APIs can be enhanced.

9. The standard provides recommendations on the two kinds of web services:
- “RESTful Web API”: a set of Web Services based on REST architectural paradigm and typically use JSON or XML to transmit data; and
 - “SOAP Web API”: a set of SOAP Web Services based on SOAP and mandate the use of XML as the payload format.
10. The standard also intends to cover the communications between IPOs and their applicants or data users, and among IPOs through connections between devices-to-devices and devices-to-software applications.



Structure of the Standard

11. The latest working draft, version 0.7, consists of a Main Body and seven Annexes. Annexes I to VI have not been completed as they are awaiting further inputs from the Task Force members. In particular, Annex II and Annex III will include recommendations based on IPOs’ practices or plans on their IP data resources being (to be) exposed through their Web APIs.

12. In addition, Annex IV – RESTful Web API Model Contract contains a draft model documentation based on the RESTful API Modeling Language (RAML) as a separate file. The International Bureau plans to develop another model contract based on the Open API Specification (OAS) and the Web Services Description Language (WSDL), which IPOs can slightly adapt in order to implement their own API.

Outstanding topics

13. The International Bureau organized an online conference on June 14, 2018, in which experts from seven IPOs participated to discuss the following outstanding issues:

- Resource names to be in plural or singular form, e.g., person, persons or people;
- Model documentation of RESTful Web API to be based on RAML or OAS;
- XML vs. JSON for payload;
- Transform XML data to JSON format and JSON Schema;
- RESTful Web API Security Model; and
- List of IP data resources.

14. Taking into account the discussions at the meeting and further comments on the topics, the working draft recommends:

- plural form rather than singular as the majority of IPOs prefer or use the plural form, i.e., persons
- model documentation of RESTful Web API based on both RAML and OAS.
- payload in both XML and JSON
- BadgerFish for transformation of XML to JSON until the JSON schema is provided. Considering IPOs gradually use JSON format more frequently, the Task Force considers that JSON schema should be developed based on WIPO Standard ST.96. However, as there is no agreed industry standard on JSON Schema, the Task Force continues to monitor the development of JSON Schema in industry. The Task Force agreed on the naming convention, Lower Camel Case, e.g., applicantName, while the names of XML components are in UCC according to WIPO Standard ST.96, e.g., ApplicantName. The Task Force also agreed to discuss further transformation of ST.96 XSD to JSON Schema.
- High-level RESTful Web API Security Model based on the proposal by the International Bureau and leave the detailed implementation to IPOs as they should follow their own Security guidance.
- list of IP data resource names and relevant information. In order to develop the list, IPOs are invited to provide the list of API resources that they (plan to) expose and wish to consume other IPOs data.

15. In addition, the Task Force discussed the benefit and need of common APIs based on the new standard, which can be easily customized by IPOs for their implementation. A Task Force member IPO suggested to develop a RESTful Web API to provide patent legal status event data based on WIPO Standard ST.27. It is proposed to discuss the need of development of common APIs and what business area, e.g., the exchange of patent legal status data, and how to work together among IPOs for the development at the Sixth Session.

FURTHER DISCUSSION AND DEVELOPMENT

16. The following items have been identified for further discussion and development:

- JSON specification based on WIPO Standard ST.96 for RESTful Web APIs
- Further alignment with OData, which is an industry standard and is followed more and more by vendors even though it is quite complex to implement.
- A conformance test is required to assert multiple implementations of the Standard. Even a test bed with installed software could be used so that anyone can call it and quantify its conformance such as W3C does with <https://validator.w3.org/> to assert HTML conformance. WIPO Standard ST.96 also provides a tool to validate compatibility of IPOs' implementation Schema against ST.96
- More model contracts for RESTful Web API using RAML/OAS and for SOAP Web API using WSDL, which will be based on rules defined in the standard, so that IPOs can download and use it as is or extend it with minimum effort. This way, the conformance of IPOs' API to the standard would be achieved and IPO implementation cost could be minimized.
- List of resources and query parameters need to be finalized, indicating which URIs with what query parameters, request body, HTTP headers and HTTP verb to use the services that IPOs provide through Web APIs
- The data format and content of response should be agreed, e.g., whether it contains the number of results, namespace, complex search grammar, etc
- Further development to include new functions, e.g., automatic notification for the updates.

17. *The CWS is invited to:*

(a) note the contents of the present document and its Annex;

(b) comment on the contents of the working draft, as reproduced in the Annex of the present document;

(c) discuss the development of common APIs, as indicated in paragraph 15 above; and

(d) request the XML4IP Task Force to present a proposal for the new standard on Web API for consideration at its seventh session.

[Annex follows]