

# Overview of the INEX 2010 Web Service Discovery Track\*

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**Abstract.** The Web Service Discovery track aims to investigate techniques for discovery of Web services based on searching service descriptions provided in Web Services Description Language (WSDL). Participating groups contributed to topic development and to the evaluation, which allows them to compare the effectiveness of their XML retrieval techniques for the discovery of Web services. This has led to the initial development of a test collection that will allow future comparative experiments.

**Keywords:** Web Service discovery, WSDL.

## 1 Introduction

An efficient and effective Web services discovery mechanism is important in many computing paradigms including Pervasive Computing, Service-Oriented Computing, and the most recent Cloud Computing, in which Web services constitute the chief building blocks. The Web Service Discovery track aims to investigate techniques for discovery of Web services based on searching service descriptions provided in Web Services Description Language (WSDL).

There were five active groups participating in the task in 2010, and they contributed to providing topics, submitting runs and assessing results.

## 2 WSDL Collection

The Web Service Discovery track used a collection of WSDL documents. These WSDL documents were directly crawled from real-world public Web services indexed by the Google search engine. The test collection was pre-processed so that only valid WSDL1.1-compliant descriptions are retained for XML-based retrieval.

The original dataset for track contained 1987 separate documents, however after some duplicates were removed, a revised version of the dataset was released containing 1738 documents (original document numbering was retained).

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\* This work was done while the second author was at Curtin University in Perth.

### 3 Topics

The participating groups were asked to create a set of candidate topics, representative of a range of realistic web service discovery needs. The submitted topics were in the same format as the ad hoc track. A sample topic is shown in Fig. 1. Out of the 31 topics submitted by five groups, 25 topics were selected for the track in 2010.

```
<topic id="2010023" ct_no="30">
  <title>airline flights</title>
  <castitle>//*[about(., airline flights)]</castitle>
  <description>Given an airline flight number I would like
    to find details of the flight.</description>
  <narrative>A service for any airline that can provide
    the status of airline flights is relevant.</narrative>
</topic>
```

**Fig. 1.** Sample topic

### 4 Submissions

The submission format was the same as the ad hoc track, submission were allowed in one of three formats:

- XML elements using XPath syntax
- passages in File-Offset-Length (FOL) format
- ranges of elements (for backward compatibility with previous INEX formats)

However all groups only submitted document level runs and had difficulty following the submission format, so some formatting corrections were required.

Five groups submitted a total of 15 runs, although all runs were used to contribute documents into the pool for each topic, three runs were excluded from the final evaluation as they included more serious errors (such as duplicate answers).

### 5 Assessment

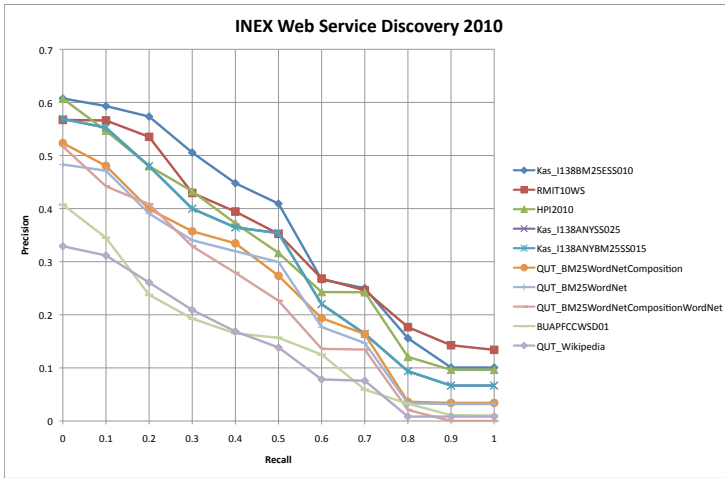
The pooling of documents from the submitted included approximately 100 results for each topic. As the XML structure was important for assessing whether a document (or parts of a document), the INEX evaluation tool for the ad hoc track was used but the WSDL documents' XML markup was displayed along the content of the elements. In some cases, there was little or no text content in the XML elements, so having the XML markup was essential in assessing the relevance. Of the 25 topics, only 20 were assessed.

## 6 Evaluation and Results

Since only document level runs were submitted, evaluation was only performed for document retrieval using Mean Average Precision as calculated by `trec_eval`. The results for the 12 valid runs are shown in Table 1, with the 11 point average precision shown in Fig. 2.

**Table 1.** Mean Average Precision for all runs

	map	Institute	Run
1	0.3469	Kasetsart University	Kas_I138BM25ESS010
2	0.3239	RMIT University	RMIT10WS
3	0.2946	Hasso-Plattner-Institut	HPI2010
4	0.2798	Kasetsart University	Kas_I138ANYSS025
5	0.2798	Kasetsart University	Kas_I138ANYBM25SS015
6	0.2348	Queensland University of Technology	QUT_BM25WordNetComposition
7	0.2233	Queensland University of Technology	QUT_BM25WordNet
8	0.2042	Queensland University of Technology	QUT_BM25WordNetCompositionWordNet
9	0.1451	Benemrita Universidad Autnoma de Puebla	BUAPFCCWSD01
10	0.1268	Queensland University of Technology	QUT_Wikipedia
11	0.1095	Queensland University of Technology	QUT_WikipediaComposition
12	0.0937	Queensland University of Technology	QUT_WikipediaCompositionWordNet



**Fig. 2.** Performance of 10 best Web Service Discovery runs

## 7 Conclusion

Now that the basics are in place for this track, we hope to get more groups participating in 2011.

Long term goal of track is given a description of a workflow (e.g. in YAWL) representing a scientific or business process, find web services that can meet the steps within the process.

Specific plans for 2011 include the following.

- Improving the collection by modifying the existing documents by extracting smaller documents from the WSDL documents to represent individual operations which will make assessments easier, and possibly adding more documents, including newer documents (e.g. more WSDL 2 documents)
- Requiring topics to be a sequence/graph of queries for a service rather than isolated information needs, which will allow two tasks: (i) document/passage retrieval (similar to 2010 but hopefully explore passage retrieval) of service components, and (ii) combining operations to meet service requirements (new).

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