

Market Requirements Document

Feature Name: **SPARQL Support**

Version: 1

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Description of the Problem

Background

“The **Semantic Web** is an evolving extension of the World Wide Web in which web content can be expressed not only in natural language, but also in a format that can be read and used by software agents, thus permitting them to find, share and integrate information more easily.

The HTML language describes documents and the links between them. RDF, by contrast, describes arbitrary things such as people, meetings, or airplane parts. .” – Wikipedia

SPARQL (pronounced "sparkle") is a W3C RDF query language. Its name is a recursive acronym that stands for **SPARQL Protocol and RDF Query Language**.

SPARQL Example (from Wikipedia)

SPARQL allows for a query to consist of triple patterns, conjunctions, disjunctions, and optional patterns. The following simple SPARQL query returns all African capitals:

```
PREFIX abc: <nowiki><http://example.com/exampleOntology#></nowiki>
SELECT ?capital ?country
WHERE {
  ?x abc:cityname ?capital ;
  abc:isCapitalOf ?y.
  abc:countryname ?country ;
  abc:isInContinent abc:Africa.
}
```

Variables are indicated by a "?" or "\$" prefix. Bindings for ?capital and the ?country will be returned.

The SPARQL query processor will search for sets of triples that match these four triple patterns, binding the variables in the query to the corresponding parts of each triple. Important to note here is the "property orientation" (class matches can be conducted solely through class-attributes / properties).

To make queries concise, SPARQL allows the definition of prefixes and base [[URI]]s in a fashion similar to [[Turtle (syntax)|Turtle]]. In this query, the prefix "abc" stands for “<nowiki>http://example.com/exampleOntology#</nowiki>”.

Problems

1. Objectivity/DB does not support SPARQL, the preferred Semantic Web query language.
2. Objectivity/DB is not particularly efficient at storing and manipulating constructs that are primarily closely related text strings.
3. The internal Objectivity/DB schema representation is designed for relatively fixed structure languages, such as C++ and Java, rather than self-defining languages, such as Generalized Markup of Defined Objects (GDMO) and those used within the World Wide Web Consortium (W3C).

Impact

Customers wishing to store data from and for the Semantic Web will have to write their own metadata and data handling interfaces to Objectivity/DB, probably using Objectivity for Java. This is likely to be a considerable barrier to the adoption of Objectivity/DB in this rapidly evolving marketplace. They will also have to use Objectivity query construct rather than a standardized Semantic Web query language.

Description of the Requested Feature

This MRD is one of five MRDs covering Semantic Web environments. The others are:

- a) Semantic Web Support (High level index to the other three MRDs).
- b) XML – Support for XML Schema and other XML standards, such as XPath and XQuery.
- c) Web Ontology Language (OWL).
- d) Objectivity/RDF.

The requested feature will provide:

- a) Support for at least the RDF and XML variants of SPARQL.

Part of an existing feature or does it require another feature, if so, which one?

This feature will add a new Objectivity product – Objectivity/SPARQL.

How is this problem being solved now, and why isn't that acceptable?

Customers who need to add RDF support for the Semantic Web to existing products based on Objectivity/DB will have to build their own metadata and data handling tools. Prospects are more likely to look elsewhere for COTS solutions. There is a danger that some customers may also look for alternative solutions, either COTS or open source.

What languages must support this capability?

- Java
- C#

- Python (later).

Which platforms must be supported?

- Tier 1 at first and all platforms eventually.

Do any competitors already have this feature?

- Oracle and IBM have a growing number of RDF/OWL tools and have endorsed SPARQL.
- [DATA-GRID](#) is developing a fully compliant, Internet enabled OWL database for delivery in Spring 2008. it will support RDF and will almost certainly add SPARQL.
- Franz [AllegroGraph](#) is a high performance RDF Triple DBMS. They will most probably implement SPARQL.

Customers who require this feature

- The Intelligence Community.
- The health sciences, manufacturing, petrochemical, telecom and financial markets.

Revenue at risk, or which could be won

- [Analysts](#) predict that the global Semantic Web market could be worth \$75 Billion annually from 2010 onwards.

When is this required?

- Before 2009, if possible.

Additional Notes

1. We will also need:

- Marketing collateral and updated Technical Publications.
- New QA material.

2. We should consider a partnership arrangement with a commercial RDF/OWL tools vendor, such as [TopQuadrant](#)