GNOWSYS-mode: An Emacs based Text Editor for Semantic and Structured Document Editing

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Abstract. Demo Submission: Keeping the requirements of semantic web in mind we have developed a special editing environment to collaboratively create, update and manage knowledge networks and structured documents, that works as a client to GNOWSYS server. GNOWSYS (Gnowledge Networking and Organizing System) is a frame based triple-store supporting ontology versioning, publishing and managing multiple ontologies along with instances. The presentation shows how the version management of knowledge networks happens on the server side and how to view and manage them from the client. The project supported by gnowledge lab, and Google Summer of Code 2009 and GNU.

1 Introduction

Semantic web community is seriously investigating several approaches to create, update and manage semantic web, of which managing ontologies is of prime concern. To name a few frameworks and implementations: Client-Server framework[1],[2] wikimedia based, software based version control[3] and through-the-web[4]. We present yet another client-server model, where the client is a well known robust, widely used, extensible text editor, Emacs.[5] The problem of change management for growing knowledge networks is handled by a frame based triple-store called GNOWSYS (Gnowledge Networking and Organizing System).[6] Since the client works as a major mode of Emacs editor and we use currently the GNOWSYS storage, it is named "gnowsys-mode" following the conventions of Emacs extensions. A very brief introduction follows:

2 The Developing Environment

Emacs We use the excellent auto-completion features, asynchronous calls to the knowledge base, rendering the text buffer to display hyperlinks to browse the networks.

Orgmode Org-mode is another extension of Emacs that does personal knowledge organization. We use the orgmode features such as: note managing, organizing, narrowing and widening of nodes, browsing with hyperlinks, versioning information in the neighborhood.

xmlrpc It’s a protocol to make procedure calls over the Internet. We use this to asynchronously talk to the knowledge base as and when the context demands while working on the text buffer.
Graphviz We use the popular graphviz libraries and the dot format for producing dynamic graphs.

3 Special Versioning Features of GNOWSYS

A very brief outline of versioning features of GNOWSYS are given below:

1. When assertions as triples are inserted into the storage, the server creates nodes with a unique SSID (snapshot ID) for each: the subject, object and predicate.
2. Whenever another node links to an existing node, a new version (snapshot) gets created, with the new node in the neighborhood. The attributes and relations thus get linked to create a frame based store, also doubling up as an index in the knowledge base.
3. An ontology instance in the GNOWSYS store is a special class with an additional attribute called “structure” whose datatype is an array.
4. An ontology is treated as a complex document (a book containing several sections) with heirarchical table of contents, represented as a nested array of SSIDs stored in the structure field of each ontology instance. Multiple ontologies can be published on the server along with instances of each ontology.

These approaches we think will enable the semantic web community to create, manage and publish the growing semantic web repositories.

4 Demonstration

The screencasts will be uploaded at the knowledge lab’s site bearing the URL http://lab.gnowledge.org/download/gnowsys-mode-screencasts/.

References