# SA-Flyer Architecture

Semantic Assistants: NLP Web Services

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Semantic Assistants support users in content retrieval, analysis, and development, by offering context-sensitive natural language processing (NLP) services directly integrated into standard desktop clients, like a word processor. They are implemented through an open service-oriented architecture, using Semantic Web ontologies and Web Services.
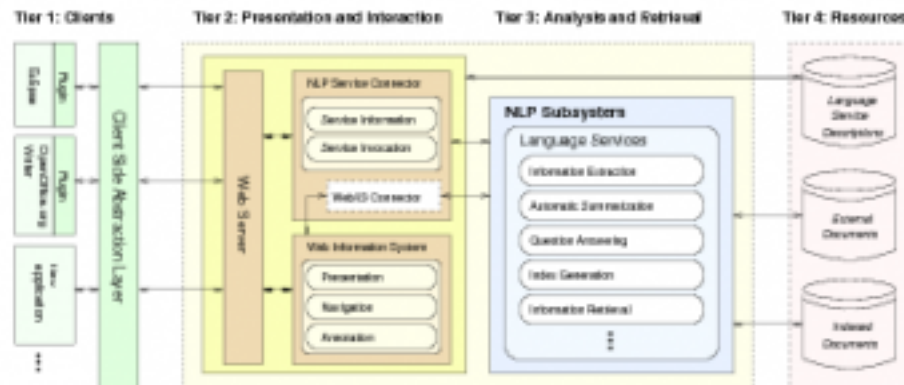
Background

The Semantic Assistants research project aims to bring advanced natural language processing and text mining tools to the modern desktop. The current version is primarily aimed at desktop (application) developers wishing to add NLP functionality, and language engineers that want to bring their analysis services directly to end users.

Architecture: Web Services for NLP

Semantic Assistants are built on a four-tier information system architecture:

Tier 1 of the architecture consists of client applications and a Client-Side Abstraction Layer (CSAL). Available clients include a plug-in for the IDE *Eclipse*, a plug-in for the LibreOffice/OpenOffice.org *Writer* word processor system, and a simple command-line client for testing purposes. Clients and server communicate through W3C *Web Services*.

Tier 2 includes a Web server and the NLP Service Connector, which is responsible for a number of tasks, including communication with the client, reading and querying the language service descriptions, running requested language services, and generating response messages.

Tier 3 is the NLP subsystem. At present, the *General Architecture for Text Engineering* (GATE) framework is supported (see http://gate.ac.uk).

More Information, Software Download, and Contact

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Open Source Software Download (AGPL3): http://www.semanticsoftware.info/semantic-assistants-architecture

Tier 4 is the resource tier. Here we have the language service descriptions, which are authored in the Web Ontology Language (OWL). Tier 4 further contains external documents, which the NLP subsystem must be able to access.

System Components

The current distribution contains the following open source components:

Server. The Semantic Assistants server is the core of the architecture. It communicates with the clients through the CSAL on one hand and the NLP framework through the NLP Service Connector on the other. As a service-oriented architecture (SOA), every service is automatically available to all clients connected to the architecture, using standard *Web Services Description Language* (WSDL) interface descriptions.

Client-Side Abstraction Layer (CSAL). A primary goal of this work is to make it as easy as possible for client (plug-in) developers to integrate NLP functionality. This is achieved with an abstraction layer (CSAL), which is located on the client side and performs the actual communication with the server.

Example Resources. To match clients with suitable services, each NLP service comes with a semantic service description in the *Web Ontology Language* (OWL) format. An information extraction (IE) example service, based on GATE's ANNIE system, is included with the distribution; other services are available for download from our web site.

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