The SenseLab Database: System Design towards Interoperability

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BACKGROUND

One of the most important aspects of informatics projects that provide services or deliver data is to make the resources provided interoperable with other applications. The shifting in computer programming strategies from the old client/server to the new multi-tier or component-based systems has diminished the importance of application software portability per se for interoperability, and increased the importance of inter-application communication standards.

The component design approach provides: encapsulation, transactions, security and application services; as result, the whole application gains ease of upgrade, flexibility, and scalability, shortening the developing time and improving error detection and correction. This design also provides a development process where different components can be developed in parallel by several collaborating developers and then assembled to create the final system.

Recently, electronic commerce demands have pushed the enhancement of the middle tier, particularly at the transaction processing monitors or runtime environments levels. The current main players in this arena are: COM+ (a Microsoft standard for software inter-operability and Distributed Computing), Enterprise Java Beans (EJB) from Sun Microsystems and CORBA, from the Object Management Group¹.

XML (Extended Markup Language) has great potential as an encoding format for multiple type of information, from relational or hierarchical data to object models or simple class definitions. SOAP (Single Object Access Protocol), an Internet Engineering Task Force working draft will play an important role in remote procedure calls using XML for encoding and HTTP for transport. [http://search.ietf.org/internet-drafts/draft-box-http-soap-01.txt](http://search.ietf.org/internet-drafts/draft-box-http-soap-01.txt)

SUMMARY OF SENSELAB

SenseLab consists of a set of closely related databases which focus on the olfactory system. SenseLab has been developed as part of the national Human Brain Project, and is designed to serve information and tools in the Neuroscience community, and to exchange data and functionality with other projects in the field.

The SenseLab EAV/CR (Entity Attribute Value with Classes and Relationships) approach² simplifies the implementation of our XML interoperability routines. The EAV/CR metadata is extracted and sent as XML schemas or DTD. Data is currently stored and extracted in models that resemble: relational, hierarchical and object oriented data³. Applications requests are made in two ways: to specific scripts on the web server or to components in COM+. We have chosen COM+ as our runtime environment because of the maturity, proved state, easy to implement and cost effective technology features. In the future, bridge applications may be created to connect the components in COM+ to others hosted in EJB or CORBA.

The creation of a controlled vocabulary is necessary to improve reliability of data collaboration in interoperable components.

References

1. COM+ and the Battle for the Middle Tier.