Real world reasons to consider a new OSS Platform for Information Logistics

SeMantic Information Logistics Architecture (SMILA)

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Georg Schmidt
gschmidt@brox.de
+49 (511) 3 69 86 - 0

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Overview

> Background

> Decision for Eclipse & CSD

> Requirements for a state-of-the-art information annotation infrastructure

> Framework architecture

> Large enterprises as a technology consumer

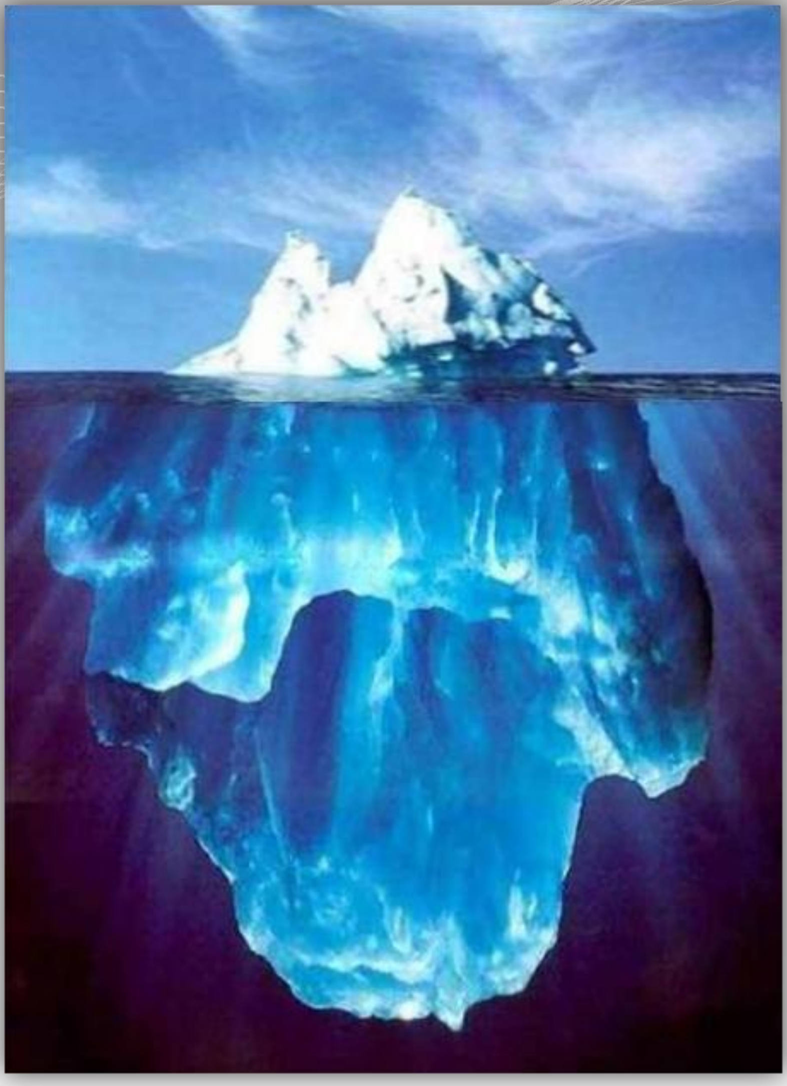
> Use cases

> Benefits of a framework from different perspectives

Background / Status quo

- Management of unstructured information is critical
- Information distribution within the enterprise is complex
- Use cases are driven by meta data
- A standardized common framework for unstructured information processing is not available
- Problems with proprietary solutions

Typical information distribution scenario



- > 6 terabyte of structured information
- > 24 terabyte of business critical unstructured information

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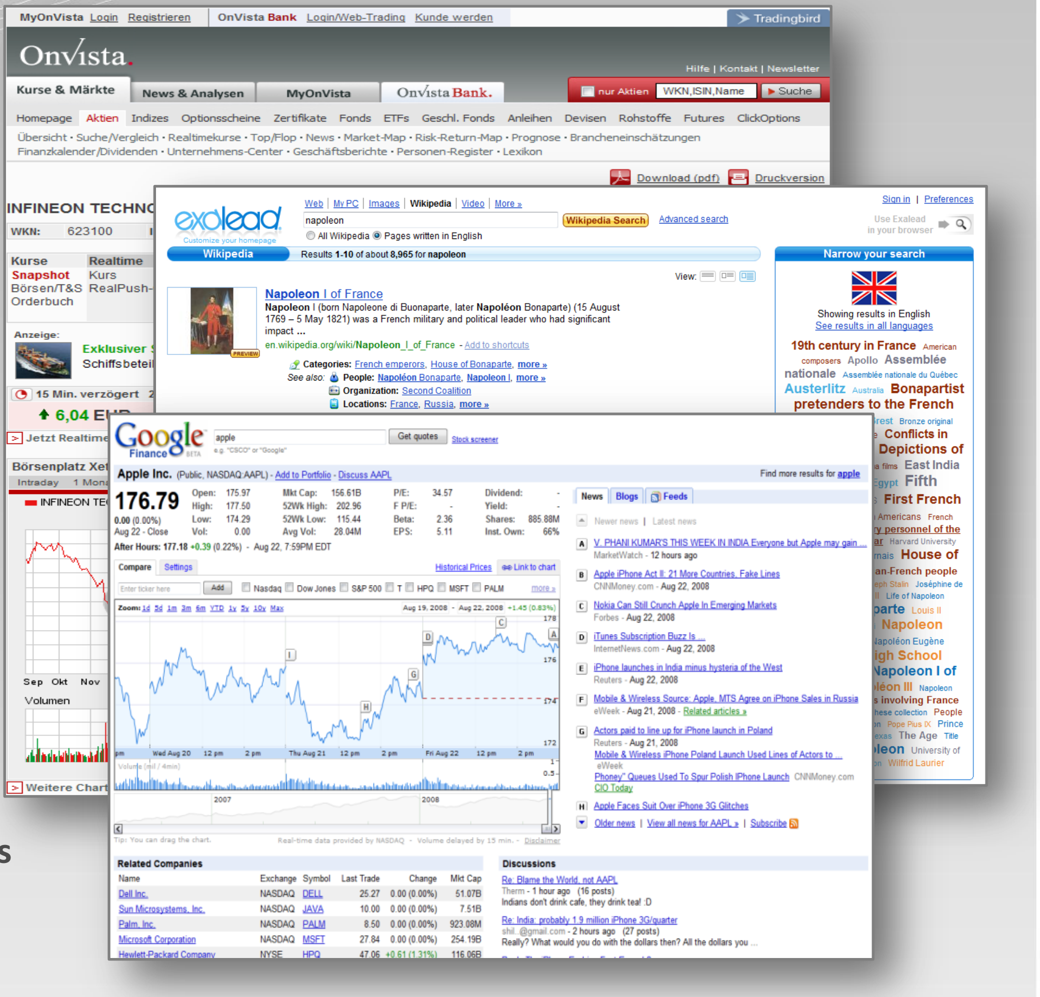
Sample use cases in the Web

- Applications are based on strongly structured data
- Some meta data must be created from unstructured information
- Sample use cases in an enterprise
  - Purchasing
  - Engineering
  - Portals
  - Service and maintenance portals
  - …



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Palm, Inc.	NASDAQ	PALM	8.50	0.00 (0.00%)	923.08M
Microsoft Corporation	NASDAQ	MSFT	27.84	0.00 (0.00%)	254.19B
Hewlett-Packard Company	NYSE	HPQ	47.06	+0.61 (1.31%)	116.06B

Discussions

Re: Blame the World, not AAPL
Therm - 1 hour ago (16 posts)
Indians don't drink cafe, they drink tea! :D

Re: India: probably 1.9 million iPhone 3G/quarter
shil..@gmail.com - 2 hours ago (27 posts)
Really? What would you do with the dollars then? All the dollars you ...

Background – Disadvantages of proprietary solutions

- Hard to implement, to maintain and to extend
- Reinventing the wheel all the time
- Slow innovation
- Long development cycles
- Support of standards?
- Flexibility?

Decision for Eclipse & Consortium based Software Development (CSD)

- Decision to launch at Eclipse
  - Global developer community in place
  - Proven track record to serve as a platform for commercial and non commercial software
  - (share cost of infrastructure and monetize personal investment)

- Why work in a consortium, why go open source?
  - Reduce investment risk for all
  - Mount a credible initiative that can become a standard
  - Build inroads for the rollout of your semantic applications

SMILA Mission and Goal

> Mission

To create a common data logistics infrastructure for next generation semantic information management systems.

> Goal

To create concepts/key components and sample implementations of the information logistics framework.

What are we doing at SMILA ?

- Build a common information logistics infrastructure to serve as a platform for key technologies:
  - Text and data mining
  - Information modeling (Ontologies, Taxonomies, Topic Mapping etc.)
  - Visualization / Navigation
  - Document translation
  - Concept extraction
  - Case based reasoning
  - Metadata management
  - Security and encryption
  - Data compression and scalability

Who is involved already? Where do we stand?

> Project initiation by Empolis and brox	January 2008
> Eclipse incubation (12 FT developers)	June 2008
> DFKI joining Eclipse to work on SMILA	July 2008
> Successful SMILA presentation at SAP	July 2008
> Official Theseus platform	July 2008
> First SMILA release (indexing process)	August 2008
> Presentation to CBR Community	September 2008
> Platform for next Computer Cooking Contest…	

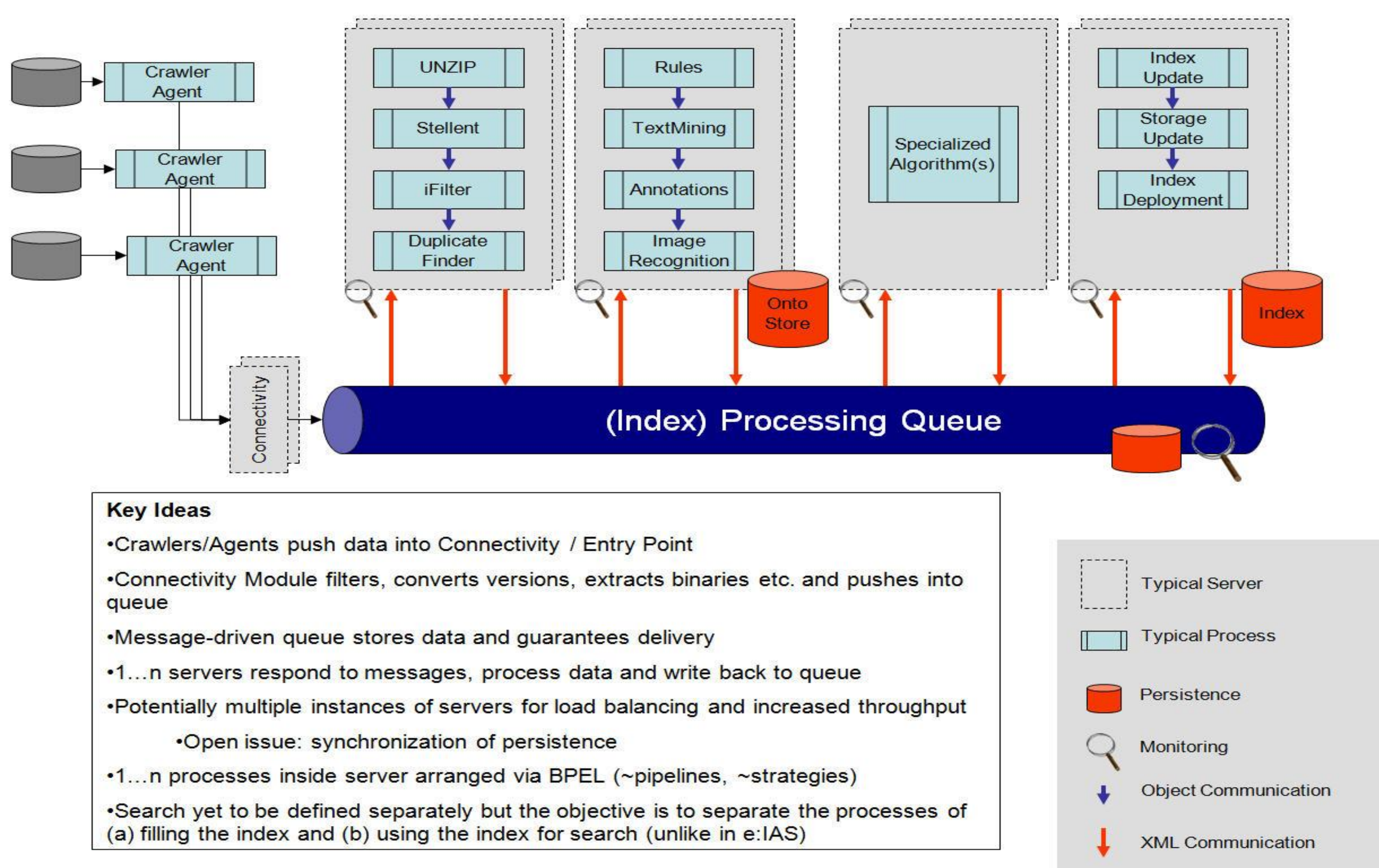
Requirements for an up to date information annotation infrastructure /cont'd

- Support of well known standards
- Building blocks with a sound component model (OSGi)
- Support for central application management
  - Management tools
  - Configuration management
  - Update handling and management
- Security
- Cross language capabilities (e.g. Java to C++)
- Availability of different distributions for different use cases
  - Grid
  - Cluster

Requirements for an up to date information annotation infrastructure .. / 2

- Deployment flexibility
  - Ease of deployment
  - Deployment on cheap hardware
- No information should be lost
- Scalability
- Robustness
- Community and partner friendly
- Well documented
- Availability of support
- Enterprise level maturity

Architecture overview



Key Ideas

- Crawlers/Agents push data into Connectivity / Entry Point
- Connectivity Module filters, converts versions, extracts binaries etc. and pushes into queue
- Message-driven queue stores data and guarantees delivery
- 1…n servers respond to messages, process data and write back to queue
- Potentially multiple instances of servers for load balancing and increased throughput
    - Open issue: synchronization of persistence
- 1…n processes inside server arranged via BPEL (~pipelines, ~strategies)
- Search yet to be defined separately but the objective is to separate the processes of (a) filling the index and (b) using the index for search (unlike in e:IAS)

Core Technologies

- OSGi/SCA as component model
- Message queue
- BPEL
- XML
- Storage (XML, distributed file system, …)
- Search technologies as well as KM technologies
  - Samples: Lucene, IBM, Fast, Google, …
  - Information extraction
    - GATE
    - Document Converter (e. g. Apache POI, Stellent, …)
  - Extreme diversity of technology companies (> 2000)

How to extend/use SMILA

- Pipelets – Components in workflow system that modify/annotate information
  - Well documented
  - Samples (XML transformation, document converters, indexing, …)
  - Visual designer could soon be used for orchestration
  - Possible implementations (UIMA, GATE, “your components”, …)
- Crawlers – Components for extracting information from data sources
  - Well documented
  - Samples (Database integration, Documentum, web crawler, Sharepoint, …)
- Easy integration in your software due to used component model
  - Please contact the community for support
  - Process not yet documented

Large enterprises / corporations (applications and application maintenance)

- Applications
  - Responsibilities (e. g. Operation, Development, …)
  - Application owners (departments / specialist divisions)
  - Optimal application functionality
  - Implementation
  - Technology know-how
  - Sustainability (standardization departments…)
- Application maintenance
  - Simple maintenance
  - Learning curve

Large enterprises / corporations (status quo)

- **Different technologies**
  (e. g. > 70 search technologies within large enterprise corporations)
- **Costs**
  - **Implementation costs**
  - **Up to five times higher maintenance costs**
- **Investment protection**
  - **Standardization departments**
- **Limited communication**
  - **Application and network zones**
  - **Firewalls**
  - **Protocols**

Large Enterprises / Corporations (Introduction of a new Technology)

- Technology penetration of a large corporation using a search technology as a sample
  - 5 % accomplished → New technology strategy
  - Are investments lost?
- Learning curve
  - How could employees be educated?
  - How could knowledge be transported to the new technology?
- How could this issue be eased?
  - Standardization → Framework
  - Technology vendors
  - Large enterprise corporation
  - We should think of the current state as a „Pre-JDBC/ODBC“ era!

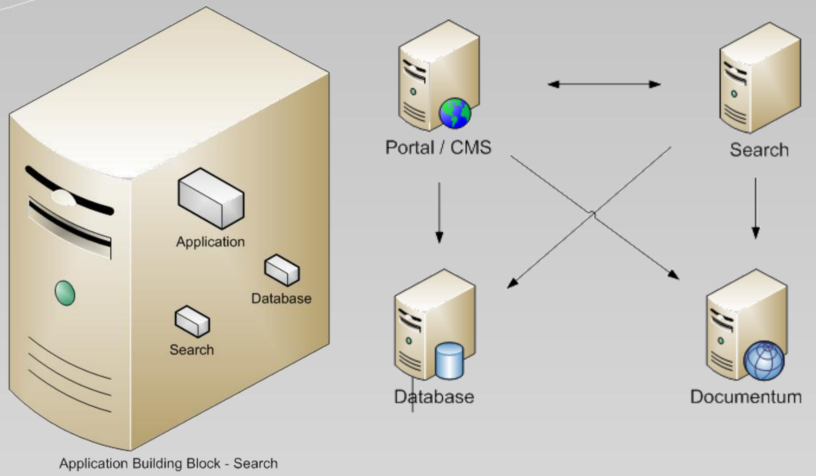
Use cases

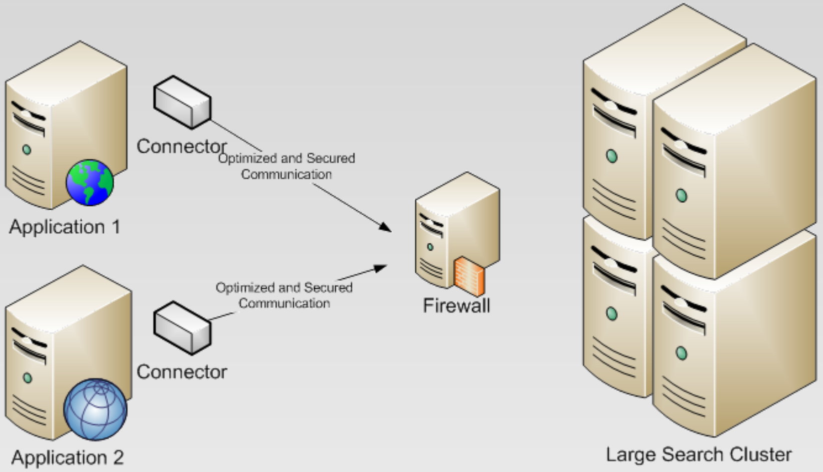
Features

- Flexible application scenarios
- One framework
  different deployments

Applications

- Search
- Doublet cleansing /-avoidance
- Database Offload
- Intelligent Web Services
- Process support
- Creation of meta data
- …





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Benefits of a framework for researchers

- Focusing on research
  - Creation of an own information processing infrastructure could be avoided
  - Ability to use real world data
- Easy creation of university spin-offs.
  - Availability of a enterprise ready commercial framework
  - Availability of support
- Ability to publish one’s work
  - No legal drawbacks for publishing
  - Ability to create software downloads from projects
- Availability of a community to discuss questions

Benefits of a framework from different perspectives

- Customers
  - Infrastructure standardization
  - Additional functionality created by the ecosystem
- Technology vendors
  - Get rid of one of the largest cost drivers
  - Additional functionality created by the ecosystem
- Research
  - Faster innovation cycles
  - Short Time-to-market

The SMILA project

- Incubation at Eclipse running
- Project overview
  - Currently 12 developers
  - Concepts available at SMILA-Wiki
  - First prototype with horizontal walkthrough
- We are preparing a downloadable version at Eclipse
  - If you are interested please contact our team
- SMILA is a technological base for the SME contest of € 90 Mio funded “Theseus” project
- Commercial support available

Project

- Contact
  - August Georg Schmidt, brox IT-Solutions GmbH
    gschmidt @ brox.de
  - Igor Novakovic, empolis GmbH

- Resources
  - eclipse.org/smila
  - wiki.eclipse.org/smila
  - Newsgroup: eclipse.rt.smila

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