Living Documents – Micro Servers for Documents

Workshop on Multimedia Data Document and Engineering (MDDE 2002)
March 2002, Prague, Czech Republic

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http://www.living-documents.org

Outline
- Motivation
- What are Living Documents?
- Architecture
- Applications
- Implementation
- Summary

Motivation
- Organizing documents
  - Individual file structures and folders stress on hierarchical structures
  - Databases provide a predefined set of attributes
- Finding documents
  - Focus on location, not on properties of documents
- Documents are mostly passive information
  - Behavior is inside (document) applications
  - Adding new behavior is difficult
- Automating document interaction
  - "Shift more responsibility to documents themselves"
  - Provide a mechanism to automate the interaction with documents

Living Documents – Main Components

Document Broker
Knowledge Repository
Document Content
Why are they called „Living“ Documents?

- Document Brokers
  - Migrating, roaming networks
  - Active, reactive and pro-active capabilities
  - Document functionality as mobile code
- Knowledge Repository
  - Documents’ memory
  - Changes in size
- Environment
  - Documents sense and interact with their environment

Document State Information (DSI)

- History
- Meta Data
- Monitoring
- Relationship

Knowledge Repository – Managing Document State Information

- Platform independent representation
  - XML, Specto Markup Language
- Uniform access to elements and attributes
- Middleware
- Separated process of interpretation
  - Ontologies
- Service facilities
  - Retrieval and deduction services

Programming and Interaction Model

- Agents as Document Brokers
  - KQML
  - Object-oriented
- XML
  - Specification, accessing, interpretation of Document State Information
- Interaction
  - Local interaction by sending messages between agents
- Coordination
  - Event model
  - Loosely coupled coordination
  - Publish/subscribe communication
Applications - Examples

- Web information systems
  - N-tier client-server architecture
  - Relational database at the backend tier
  - Example: PaperBase - Creating Personal Information Workspaces
    http://www-sr.informatik.uni-tuebingen.de/~schimkat/pb
  - Digital document archive

- Living Hypertext
  - Web information retrieval
  - Inter-linked Living Documents
  - Topic distillation
  - Calculation of hub and authority scores

- Workflow applications
Implementation

- Mobile agents
  - Okeanos – mobile agent framework
  - Java (JDK 1.3)
  - JESS (Java Expert System Shell)
- XML-based knowledge repository
  - Spectro Markup Language
  - Simple query language
- Coordination middleware
  - Siena – global, content-based event notification middleware
  - Mitto – lightweight, subject-based event notification middleware

Summary

- Living Documents
- Assigning lightweight databases to documents
- Documents with active and pro-active capabilities
- Middleware for interesting new kinds of applications

Further Informationen

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