System Integration

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About me and us

Application Development (Financial Sector)

VASER Frameworks

Distributed Models

1996

OBJECT dynamics
Deutschland

Product development

vaserControl

2009

NATURAL Software
Spanien

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References

- ZFS – Zurich Financial Services
- VKB
- Hugo Boss
- Deutsche Bank
- OBJECTdynamics
  Germany
- superDeli
- ianus
- NATURAL Software
  Spain
- Private Villas

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Presentation

- It all started back in 2000…
  - Existing application
    - Insurance application
      - Management of new and existing life insurance contracts
  - Needed to build Java Frontend
    - Distributed environment
  - Implemented a facade-based access to Smalltalk
  - Over the years…
    - We used the same technology to build
      - Smalltalk Clients
      - C# Clients

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Existing application

- Existing large scale application
  - Complex architecture
    - Access to DB via CICS/Cobol
    - Model driven approach
  - Complex business object model
  - Existing Rule engine
    - Very small granularity of rules being used
    - Basically every entry is checked
Architecture

- Existing large scale application

<table>
<thead>
<tr>
<th>GUI</th>
<th>EOM</th>
<th>Service</th>
</tr>
</thead>
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<tr>
<td>VASER Frameworks</td>
<td></td>
<td></td>
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<tr>
<td>Project</td>
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</tbody>
</table>

Smalltalk application (Rich client)

Host

CICS

Database

DB/2

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New Development

- Requirement
  - Turn the „rich client“ application into an advanced, distributed application
  - Build a Java Frontend
    - Use AWT (2000)
  - „Re-Use“ existing application as central backend
    - Transformation from „Rich client“ to „Server“
      - Multiple parallel transactions
      - Multiple concurrent instances of the object model
  - ~14,000 Clients in ~3,000 locations using 7 servers
New Architecture

- CICS
- Host
- DB/2
- Database

VASER Frameworks

Smalltalk application (Server)

GUI  EOM  Service

Project

Java Frontend

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Requirements

- Access to the object model from a Java frontend
  - Low granularity
    - Method level (Action)
  - Fast
    - On method executions, normal rule checking has to occur
  - Scalable
    - Target: 14,000 Clients using 7 Servers
## Decision Table

- **Decisions (Remember, this was in 2000)**
- **Communication on an object level**

<table>
<thead>
<tr>
<th>Method</th>
<th>+</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java/RMI</td>
<td>•Available</td>
<td>•Slow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>•Only Java datatypes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>•Granularity too large</td>
</tr>
<tr>
<td>Corba</td>
<td>•Available</td>
<td>•Slow</td>
</tr>
<tr>
<td></td>
<td>•Standard</td>
<td>•Only Corba datatypes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>•Granularity too large</td>
</tr>
<tr>
<td>Webservices</td>
<td></td>
<td>•Haven’t been invented yet…</td>
</tr>
<tr>
<td>VASER RemoteRepository</td>
<td>•Fast</td>
<td>•Had to be developed</td>
</tr>
<tr>
<td></td>
<td>•Fits into the Backend Architecture</td>
<td></td>
</tr>
</tbody>
</table>
Facades

Function call

Java Facade

Message send

Smalltalk Business Object

Result

Repository

Provides Object Id

Result

Message send

perform

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Facades

- Java Facade for a Smalltalk Object
  - Actions
    - Actions may be performed and may change attributes
  - Attributes
    - Changes in attributes invalidate derived attributes
    - Cache for server values
  - Behaves „like a Smalltalk Object“
Cool stuff

- aFacade inspect
- Debugging
- Breakpoints

- Development in the debugger
  - I do 80% development in the debugger
Analysis

- Network Latency biggest performance issue
- Block size 1…2k Byte
- Number of datablocks and parallel sockets was/is not an issue
Other functionality

- Event propagation

  - Facades have to be marked invalid, if someone else changes a value

  - Solution: EventManager waits on events for registered objects
Event propagation

- Distribution of changes
  - Objects are marked read-only
  - If read-only exception
    - Change will be done anyway
    - Object fires events to registered facades to invalidate attribute value
    - If required – client facade reloads
Other functionality

- Garbage Collect
  - Side effect of event propagation

- All remote objects are in a weaktable (RemoteRepository)
  - Remote usage is a object reference

- If taken out, they send a special event
Other functionality

- Performing an action requires
  - Invalidating and reloading all attributes
  - Reloading all attribute descriptors
    - Type
    - Fieldlength (for database mapping)
    - Infotext (Information about each attribute like "value has to be between x and y")
- Messages
  - Information, Warning, Error, etc.
Tools

- Facade generator
Other programming languages

<table>
<thead>
<tr>
<th>Facades</th>
<th>Tools</th>
<th>Application</th>
</tr>
</thead>
</table>
| Smalltalk                | Generic Facade | Not needed                         | VASERControl
|                          |       |                                                 | • Editor
|                          |       |                                                 | • Registration
|                          |       |                                                 | • Distributed Energy metering |
| C#                       | Yes   | Yes                                             | VASERControl Frontend
|                          |       |                                                 | • Silverlight |
|                          |       |                                                 | • Microsoft Surface |
| Java                     | Yes   | Yes                                             | • Insurance project |
|                          |       |                                                 | • SpiritSE Test tool |
| Actionscript (Flash)     | Yes   | No                                              | VASERControl Frontend
|                          |       |                                                 | • Flash |
**VASER CONTROL**

- **Product development**
  - 2004 – Renovation of our kitchen
  - Latest gadgets
    - KNX
    - Serve@home
    - Miele@home
  - Integration? Yes, but how?

- VASER framework usage led to **VASER CONTROL** product development
Goals

1. Integration Platform
   - Making the best use of all the automation systems

2. Visualisation
   - Making all the different systems usable
Using RemoteRepository

- Browser with Silverlight
- VASERControl Editor
- Internet
- VASERControl Server
- Registration Server

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Architektur – Architecture
Multiple visualization possibilities
**VASERControl**

- Energy Dashboard (Silverlight Basis)
  http://metering.vasercontrol.com/

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VASERCONTROL NextGen

- Microsoft Surface (3D rotating)
The best way to predict the future is to invent it.

Alan Kay

Good things are simple.

NATURAL Software - Practice
Thank you

Questions? More information?

- http://www.natural-software.eu
- http://www.vasercontrol.com

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