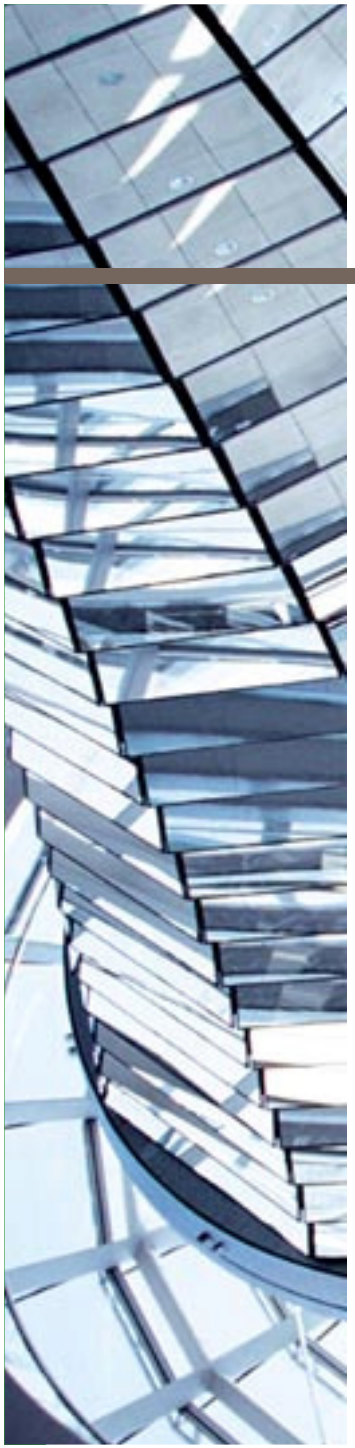


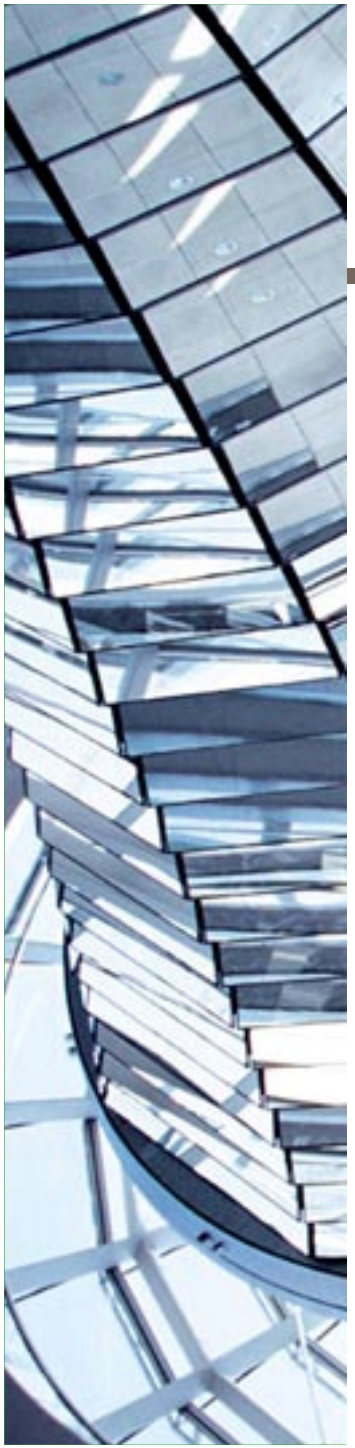
9. Systems Integration
Reference Architectures and Patterns

Winter Semester 2008 / 2009
Prof. Dr. Bernhard Humm
Darmstadt University of Applied Sciences
Department of Computer Science

h_da
HOCHSCHULE DARMSTADT
UNIVERSITY OF APPLIED SCIENCES

The lecture in the context of the entire course

1. Introduction
2. A reference architecture for business information systems
3. Application kernel
4. Persistence and transaction
5. Authorization
6. Client architecture
7. Exception handling
8. Business Intelligence
9. Systems integration
10. Service-oriented architecture
11. Selected design patterns
12. Design for testability



Agenda

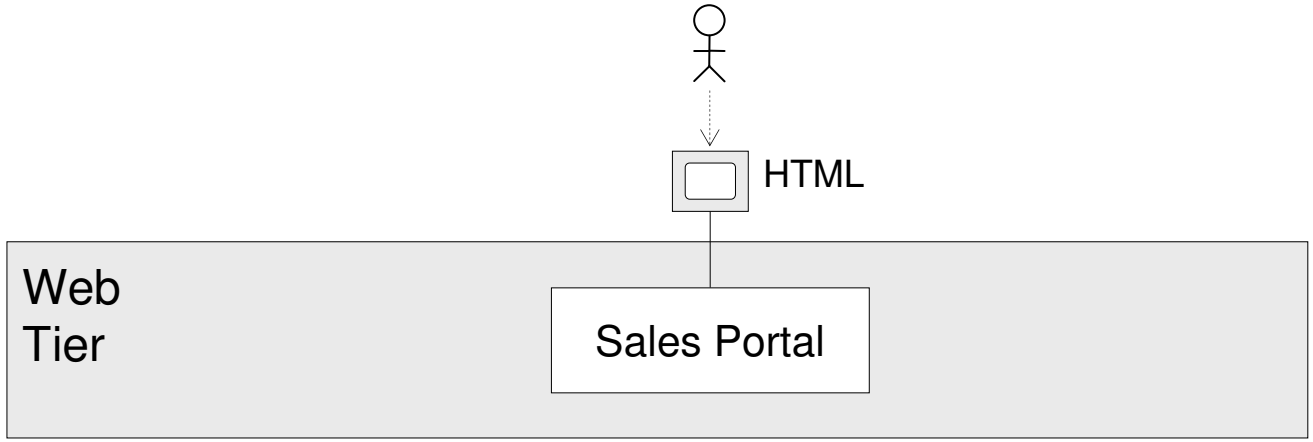
➔ **Example**

Methodology

Reference architectures for integration

Literature

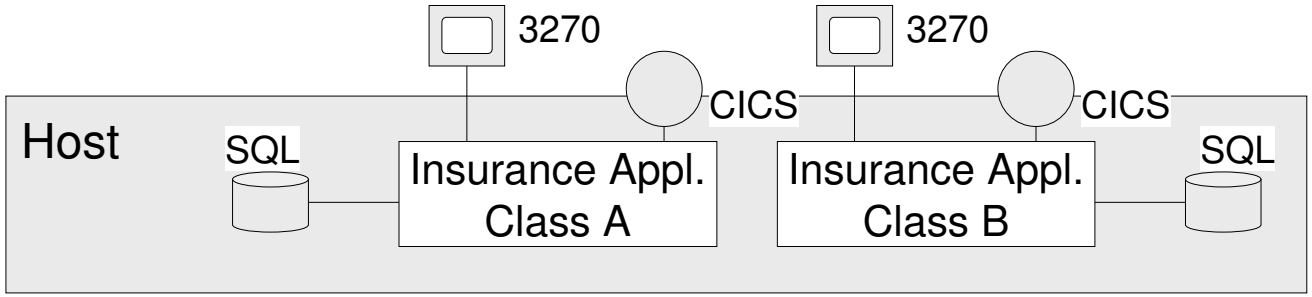
Project: Implement an Internet portal for selling insurances of different classes



- Internet end user may get information on and order insurance products
- Uniform sales portal for selling insurance product of different classes, e.g.,
  - A. Life insurance
  - B. Automobile insurance
- Portal shall be integrated in back-end applications of insurance corporation

Existing legacy applications

- Existing legacy applications:
  - A. Life insurance: needs extensions for internet sale
  - B. Automobile insurance: may be used directly for internet sale
- Technology of legacy applications:
  - Host technology: implemented in COBOL using CICS transaction monitor
  - SQL database DB2 on host
  - 3270 dialogs



How to build the portal?
Alternative 1: Throw everything away!

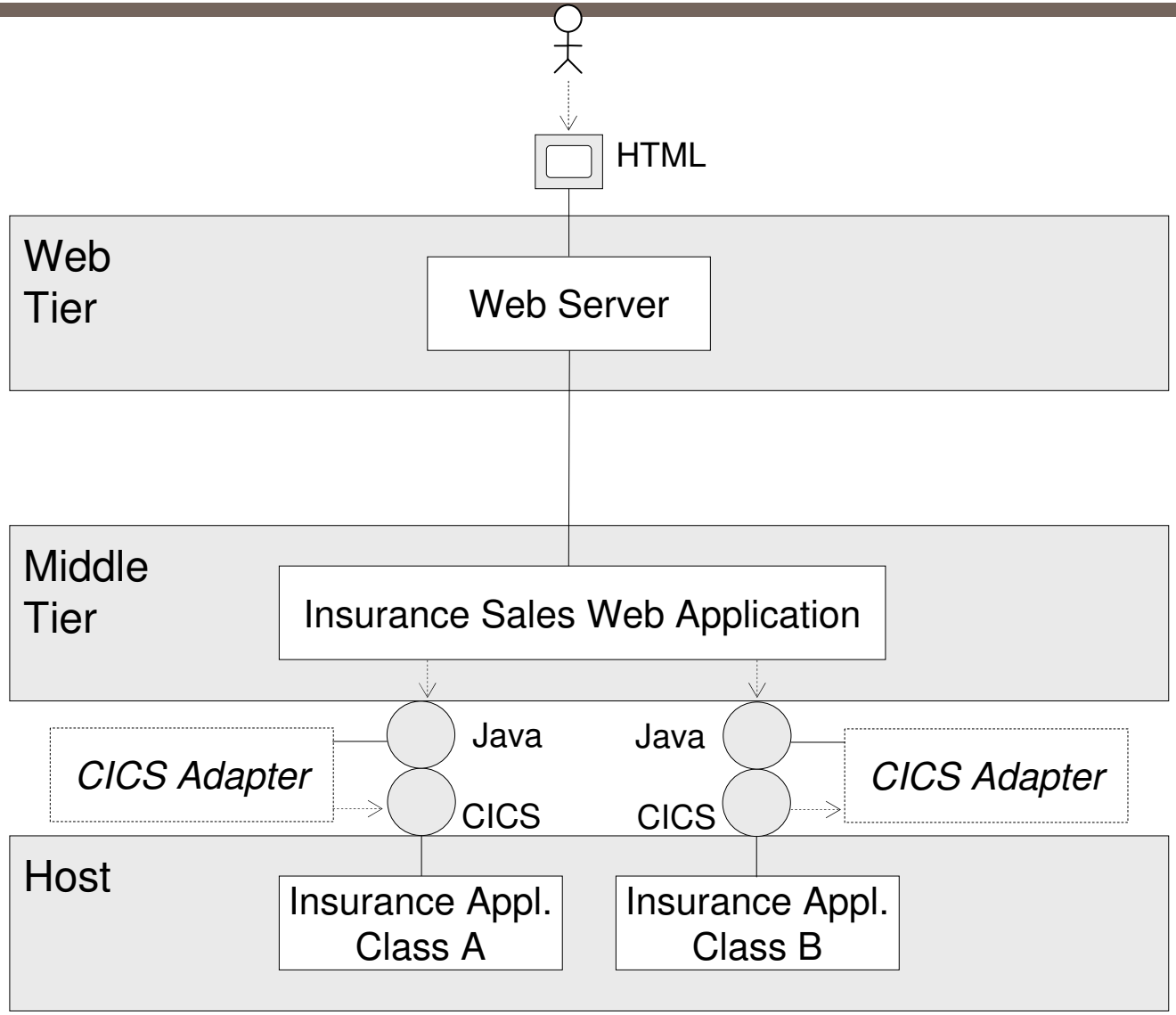
- Implement new Insurance applications for all classes (life, automobile, etc.) in Java (JEE) on Unix servers
- Implement portal using Java Server Faces (JSF) technology

Pros / Cons

- ⛔ Extremely costly
- ⛔ Extremely risky
- ⛔ Extremely time-consuming

- ✚ Modern technology

How to build the portal?
Alternative 2: SOA forever!

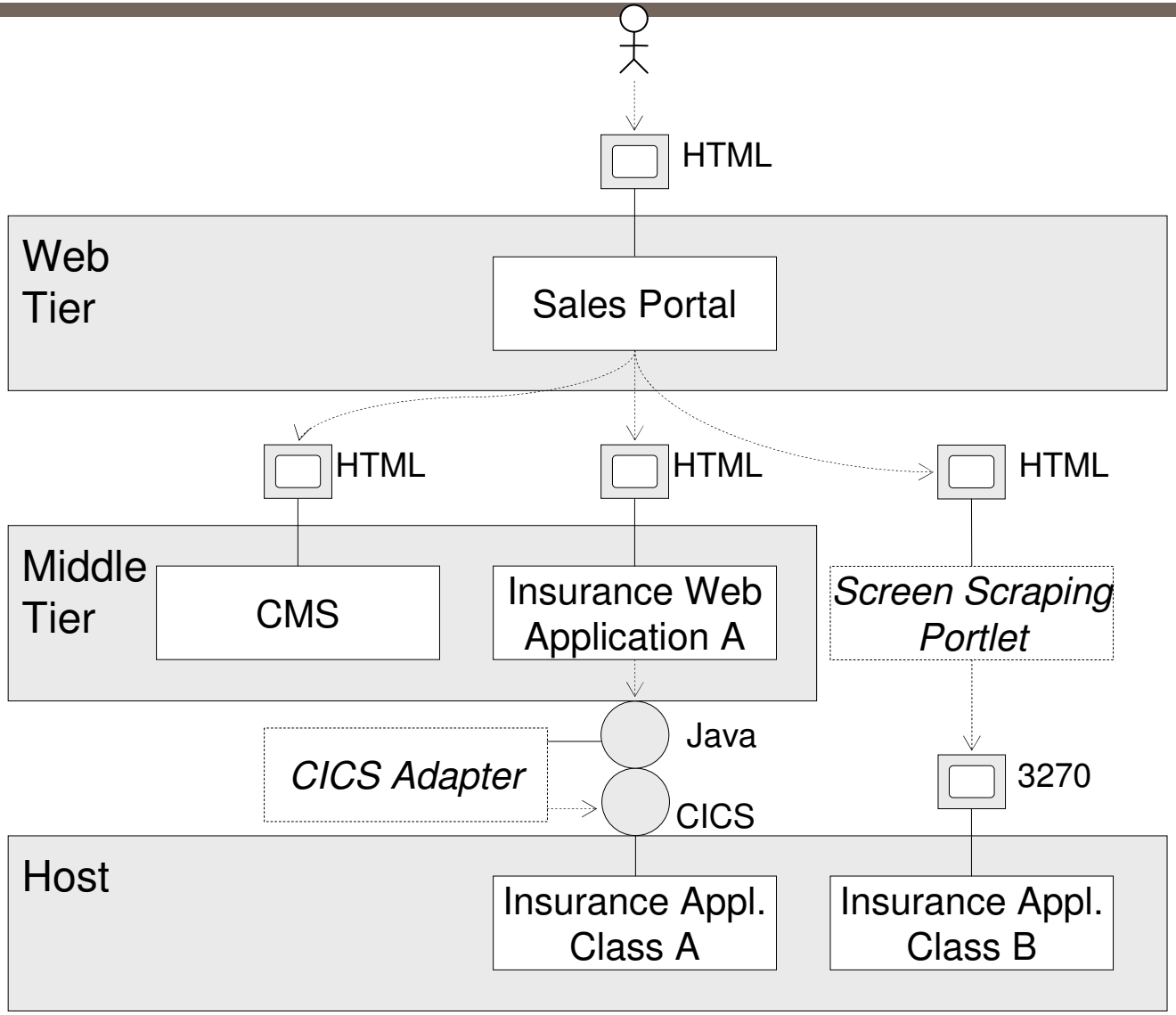


Pros / Cons

- Costly (Adaptation of host applications
- Time-consuming

- Architecturally brilliant

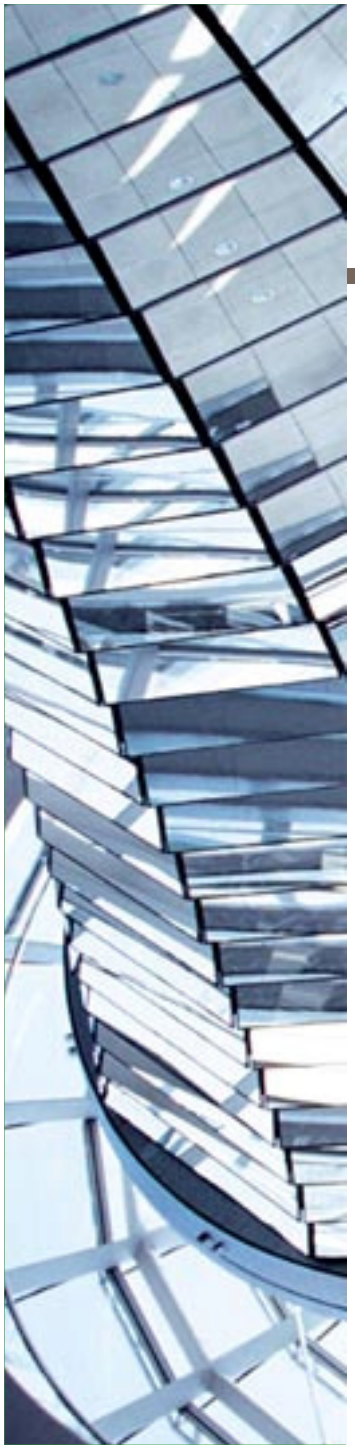
How to build the portal?
Alternative 3: Smart integration architecture



Pros / Cons

- Cost-effective
- Rapid implementation
- Optimal reuse of existing applications
- Adequate architecture

- Limited extensibility



Agenda

Example

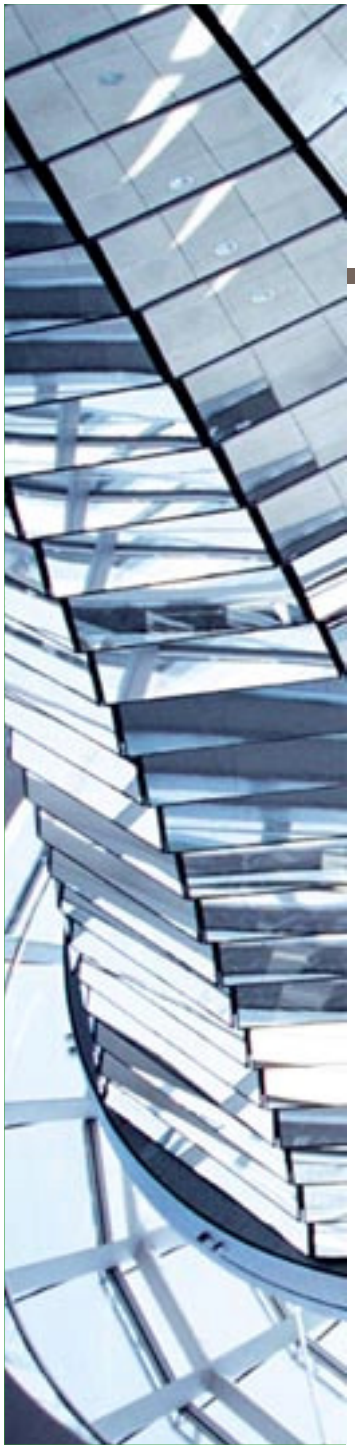
➔ **Methodology**

Reference architectures for integration

Literature

Methodology for integration projects

- 1. Analysis
- 2. Definition of logical integration architecture
- 3. Identification of integration services, based on reference architecture
- 4. Selection of integration platform, based on product map
- 5. Implementation
- 6. Test



Agenda

Example

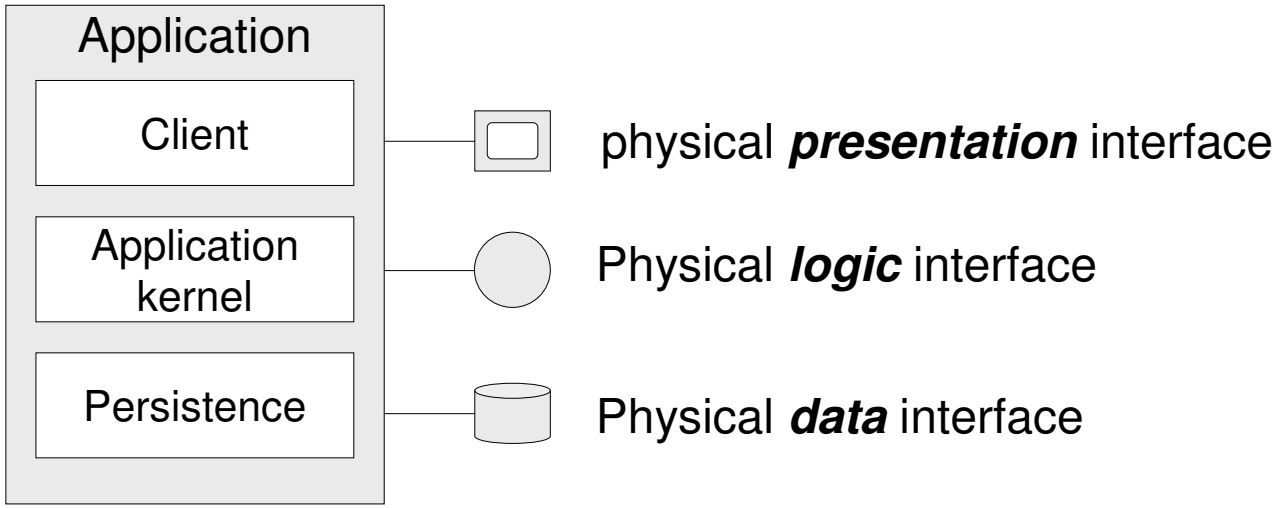
Methodology

➔ **Reference architectures for integration**

Literature

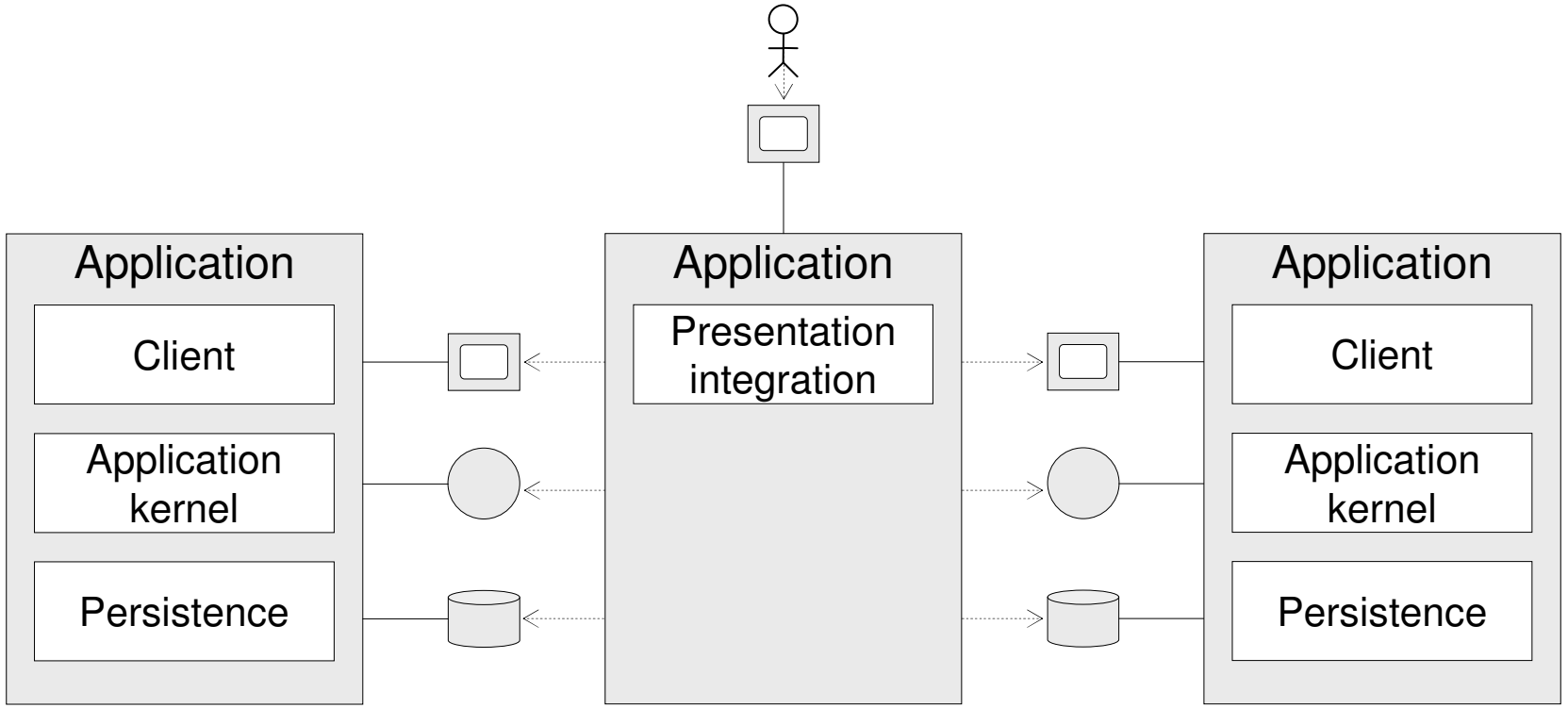
1. Analysis: physical interfaces

- What are the requirements?
- Which applications are to be integrated?
- Which physical interfaces (integration points) do they provide?

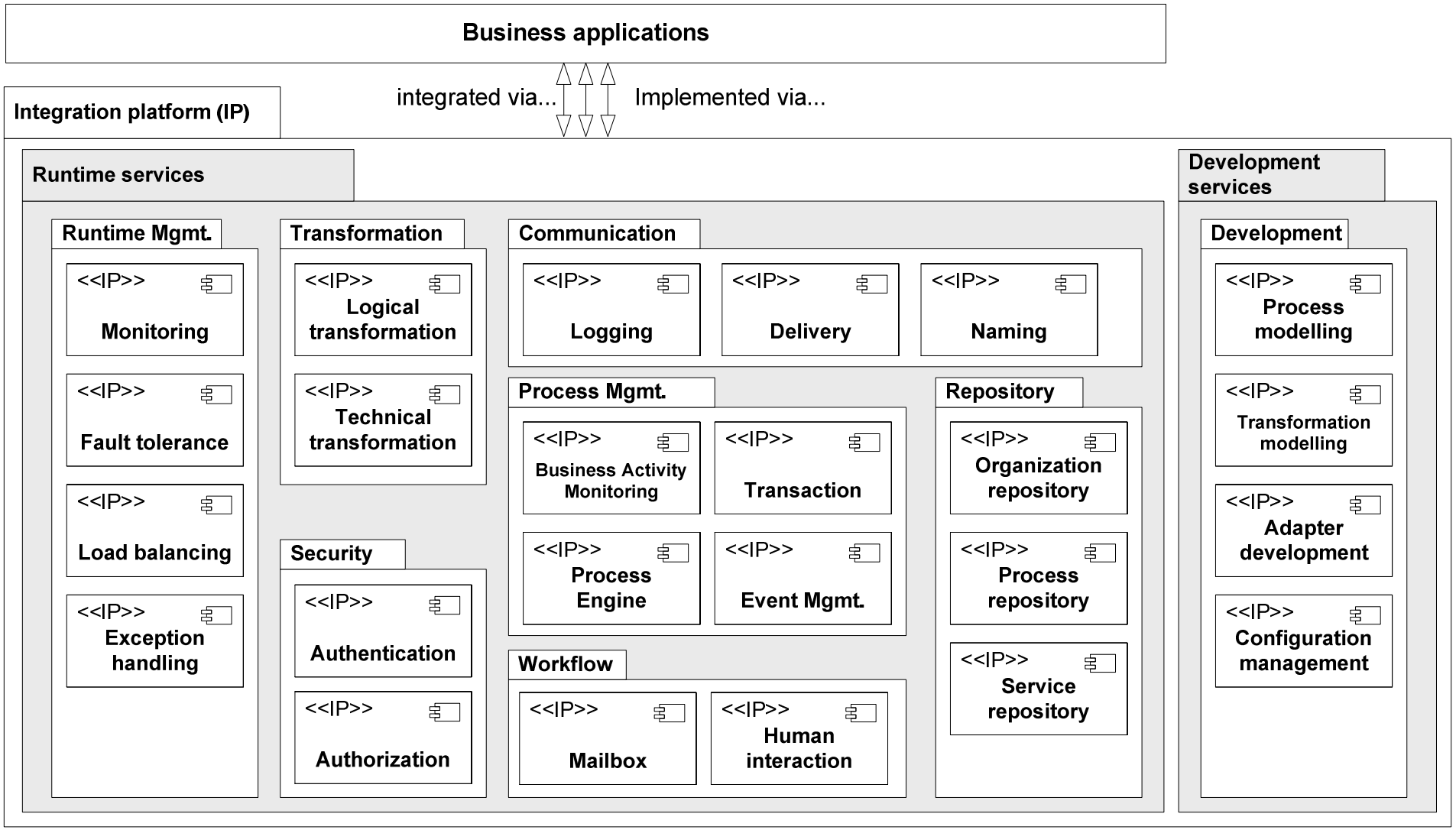


2. Definition of logical integration architecture: integration types, transformation of physical interfaces

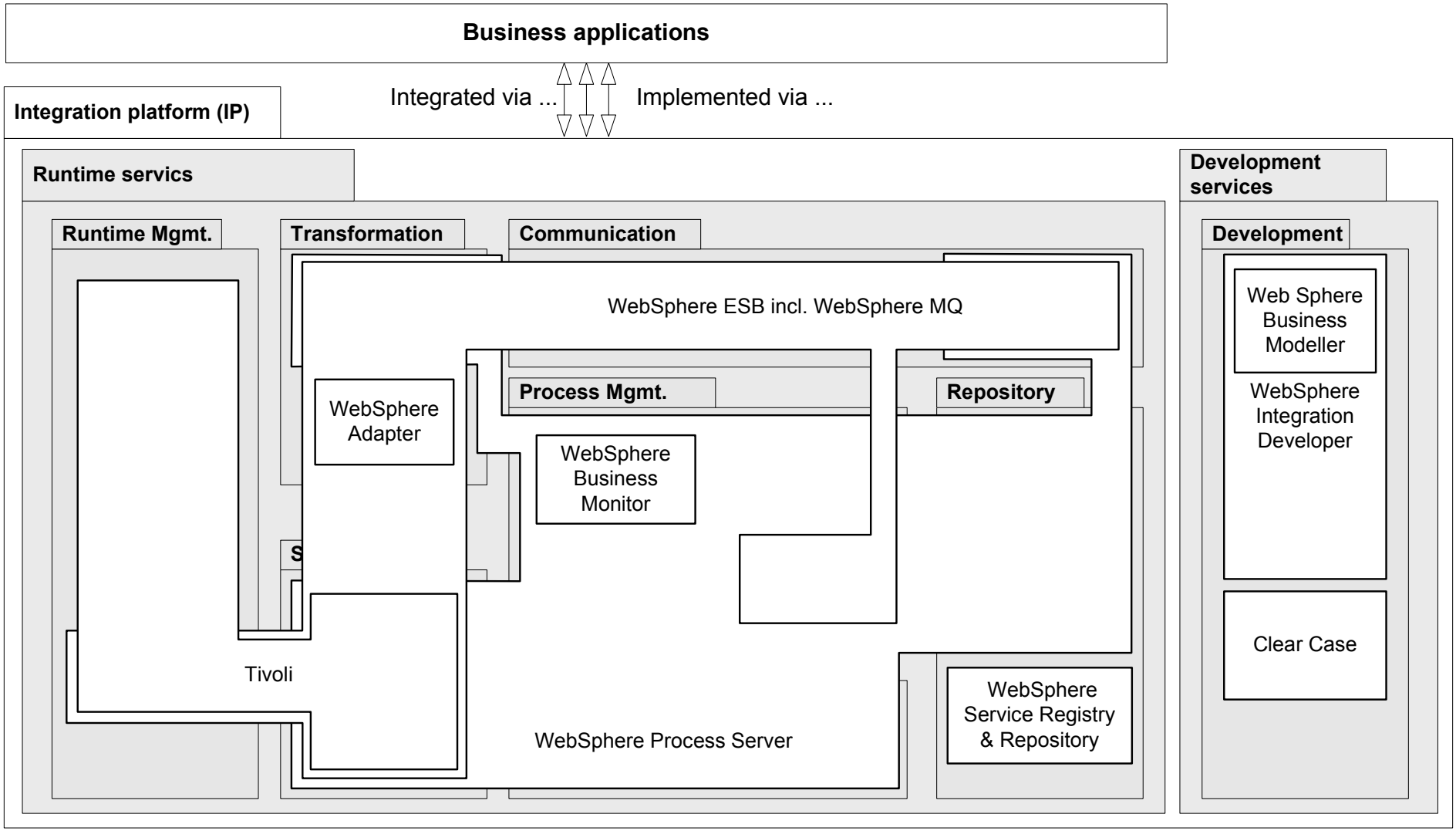
- Which type of integration (presentation, logic, data) is used for which application?
- Which physical interfaces need to be transformed,
  e.g., screen scraping: presentation (3270) → logic (WebServices)?



3. Identification of technical integration services: Reference architecture for technical integration services (Example: logic integration)

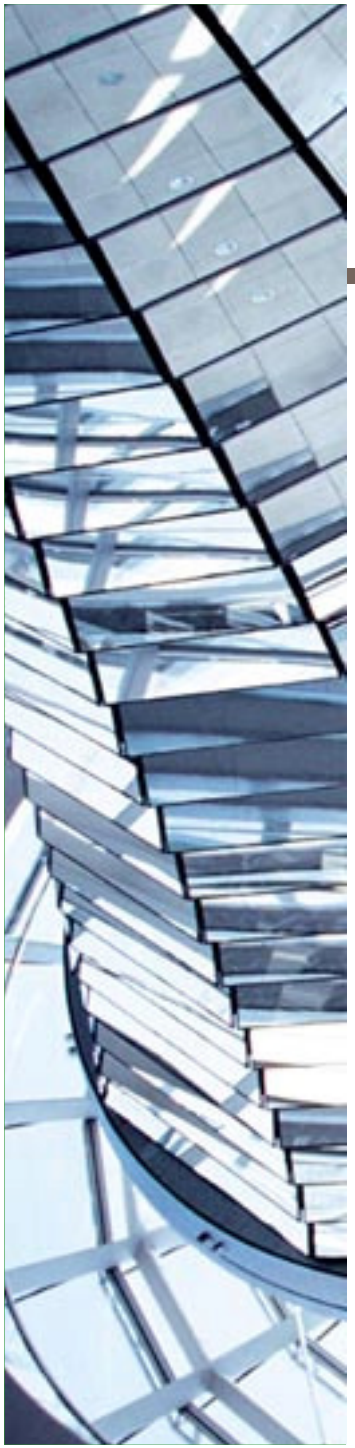


4. Selection of integration plattform: Product maps based on reference architecture (Example: IBM products on service integration)



5. Implementation
6. Test

- Implementation of integration platform
- Implementation of applications
- Integration of applications
- Test



Agenda

Example

Methodology

Reference architectures for integration

➔ **Literature**

Literatur

- Bernhard Humm, Marc Lohmann, Markus Voß, Johannes Willkomm: *Ein praxiserprobtes Rahmenwerk für die technische Anwendungsintegration*. In: Bleek, W.-G., Schwentner, H., Züllighoven, H. (Hrsg.): Software Engineering 2007 - Beiträge zu den Workshops. Lecture Notes in Informatics, Band 106, Gesellschaft für Informatik, 2007.

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