CORBA-based
Enterprise Application Integration

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Introduction

Hitachi is developing full-featured EAI technology which:

- is centered on the business process (workflow)

- is CORBA-based

- achieves ease of use via simple APIs and a component-based approach.

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Architectural Overview – Components

- Workflow manager – WCO

- Reliable messaging – AM

- Enterprise Application Manager – HiEM

- Transformation Engine – Data Junction

- Adapters – constructed with user components assembled into provided container

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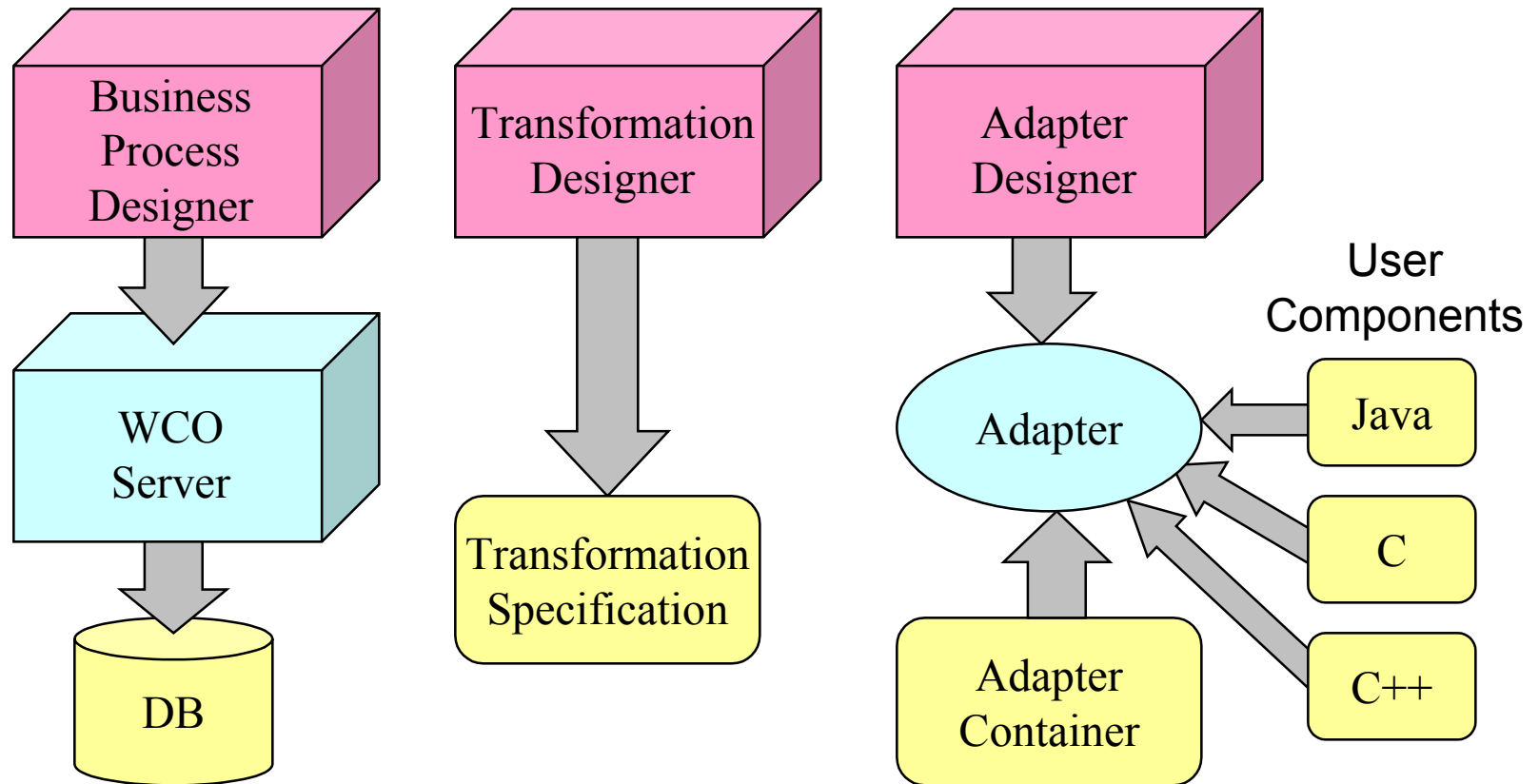
Architectural Overview – Conceptual Model

- Workflow specification (the Business Process) describes business data flow.
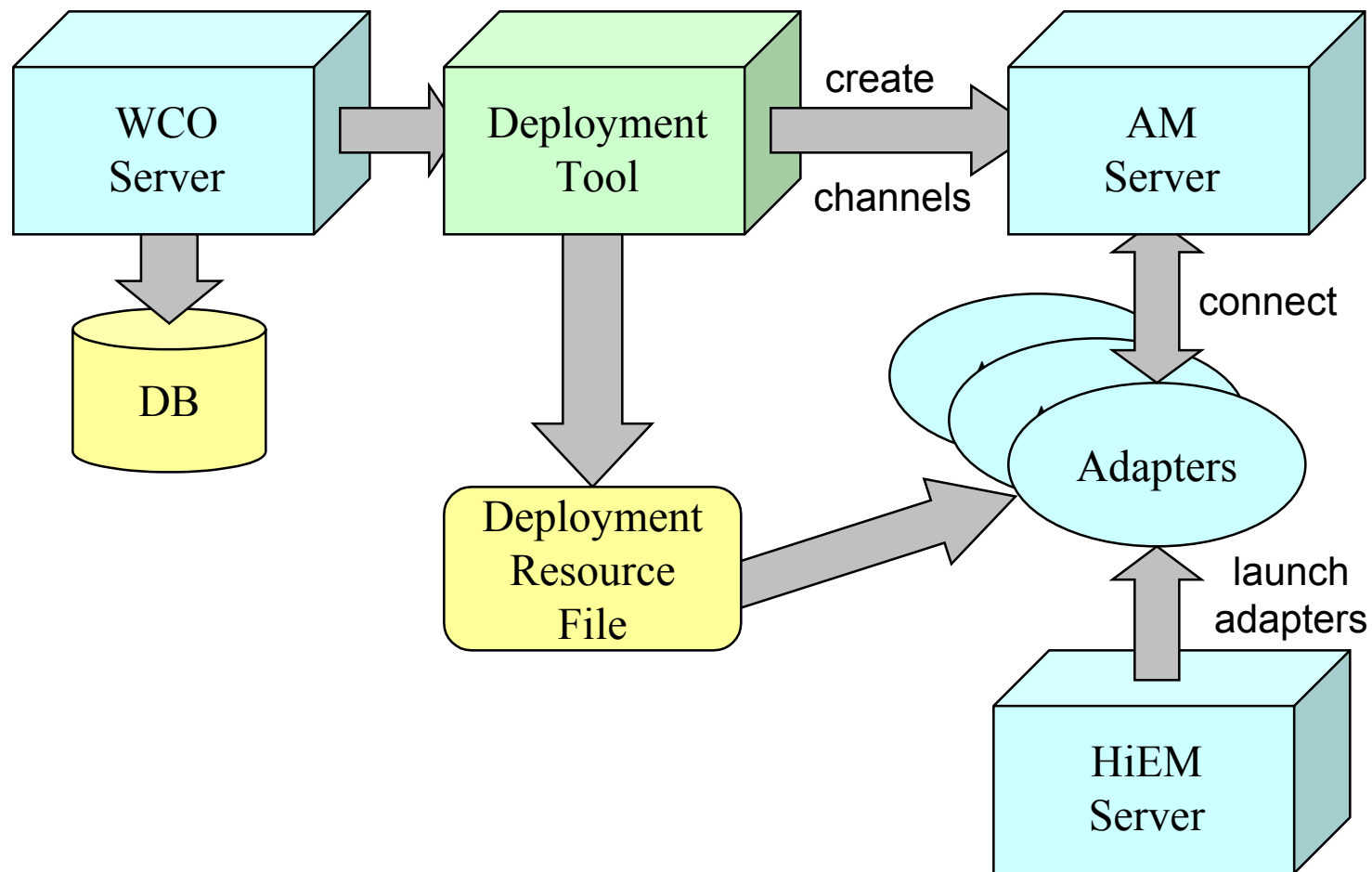- The Business Process is the root-level "application":
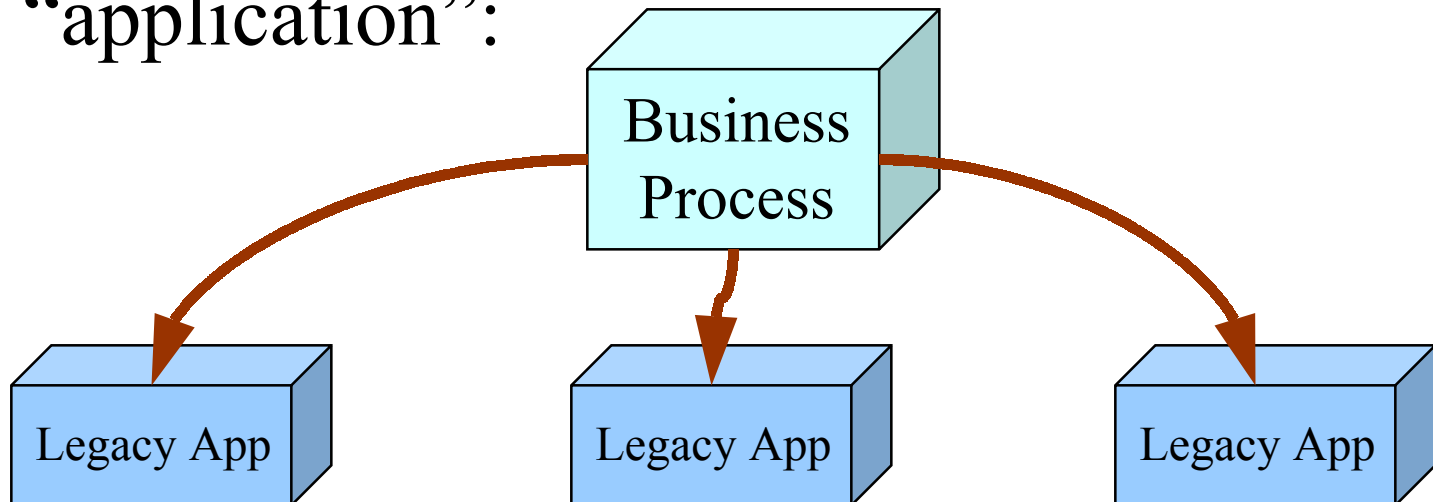
Architectural Overview – Lifecycle

- Three phases:

- Design - define business process (BP), data transformations; configure adapters

- Deployment - automatically create message queues implementing data flow in BP

- Runtime - launch adapters; automatically connect data flow; instantiate BP; monitor

Architectural Overview – Design Phase

Business Process Designer → WCO Server → DB

Transformation Designer → Transformation Specification

Adapter Designer → Adapter

User Components: Java, C, C++ → Adapter

Adapter Container → Adapter

Architectural Overview – Deployment

WCO Server → Deployment Tool → **create** → AM Server

channels

WCO Server → DB

Deployment Tool → Deployment Resource File → Adapters

AM Server ↕ **connect** Adapters

HiEM Server → **launch adapters** → Adapters

Architectural Overview – Runtime

Use of CORBA in Hitachi's EAI

- WCO is based on proposed OMG spec (WfMC-sponsored).

- AM is based on OMG Notification Service.

- HiEM is a CORBA service layered on top of the Notification Service.

- Adapters are Java clients to all these services.

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Problems Encountered with OMG Specs

- Awkward to implement end-to-end persistent QOS using NS API

- Notification Service and workflow-management redundantly provide control of flow – performance, consistency issues.

End-to-End Persistence with NS API

- NS provides persistent QOS, but need end-to-end persistence throughout business process

- Want to avoid transactions, for performance reasons

- Adapter needs to control when NS can deallocate a message

- Must use the "push" API and thread synchronization – very awkward

Redundant Control Flow with AM, WCO

- Message queues between adapters provide flow of control, along with data flow (block until message received).

- Workflow manager wants to control flow too (so state of BP can be monitored or altered).

- Result: redundant messages between adapters and WCO.

- Could be fixed with specification changes.

APIs with No OMG Specification

- Enterprise Application Management.
- Data Transformation

Enterprise Application Management

HiEM client API includes:

- Application launch, monitor, restart on fail

- User-extensible push and pull metrics, in hierarchical namespace

- Centralized reporting of errors and other events

Data Transformation

Data Junction embedded-engine API includes:

- Load/unload mapping specifications

- Set source, target names

- User-implemented source and target

- Run transformation

- Process exceptions

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Summary

- Current OMG Specifications do not cover all APIs needed for EAI.

- A few problems exist with the use of some OMG specifications for EAI.

- CORBA provides a good foundation for integrating an EAI solution into a single coherent product.