ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich
http://www.ethz.ch

Jopera
Process Support for Web Services
http://www.jopera.org

IKS Information and Communication Systems Research Group
http://www.iks.inf.ethz.ch

Rapid Composition of Web Services with JOpera for Eclipse

JOpera offers a visual language for programming compositions made of many kinds of services

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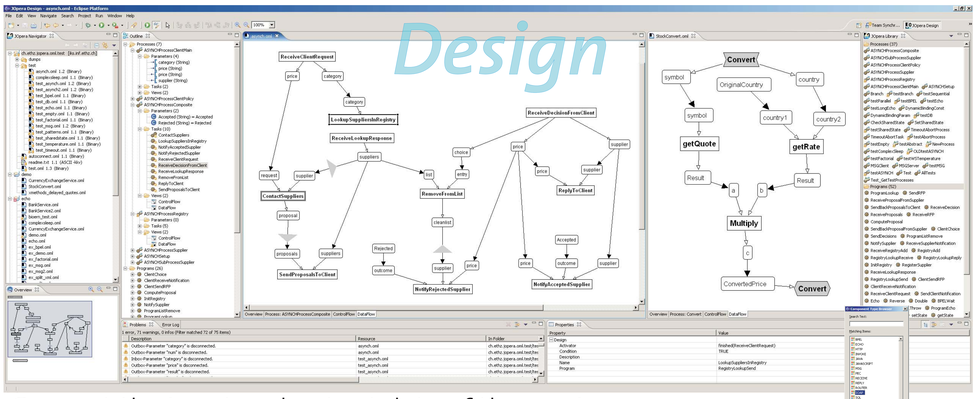
JOpera provides a flexible autonomic platform for efficiently executing compositions

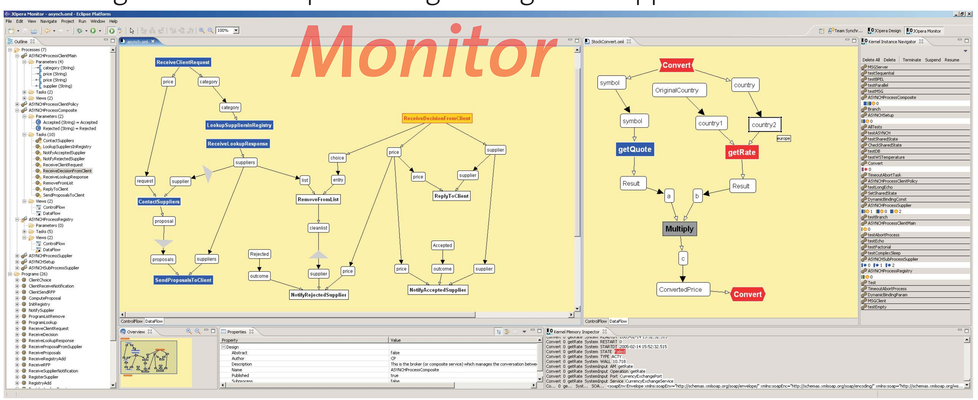
1

Import the WSDL interface of the Web services
Choose a reusable service from the library



2

Connect the input and output data of the services
Add integration and adaptation logic using Java snippets



3

Run, monitor, test and debug the execution using the same visual language

Visual Composition Language

JOpera uses a simple visual syntax based on graphs to model the interaction between different services as a Process.
The structure of a Process is defined by drawing:

- the **Data Flow** between parameters of service interfaces
- the **Control Flow** defining the partial order of service invocations, loops, branches and exception handling

Main language features

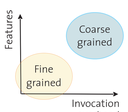
- **Nesting:** composite services are composable
- **Recursion:** a composite service can invoke itself
- **Iteration:** list-based loops and control flow loops
- **Dynamic late binding** of interfaces to implementations
- **Interface Adaptation** of data and interaction style mismatches can be solved with the same visual syntax used to compose the services
- **Reflection:** a composition can interact with the runtime architecture

The visual language is **compiled** to Java code for execution

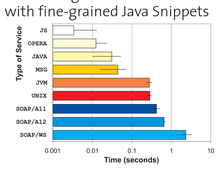
Beyond Web Service Composition

- Services are composed at the level of their interfaces.

- The visual composition language is not affected when adding support to invoke a new kind of service (future-proof)

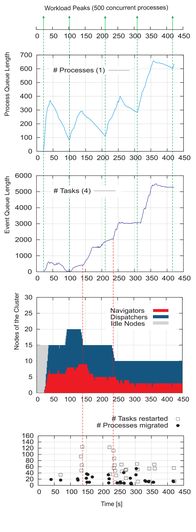


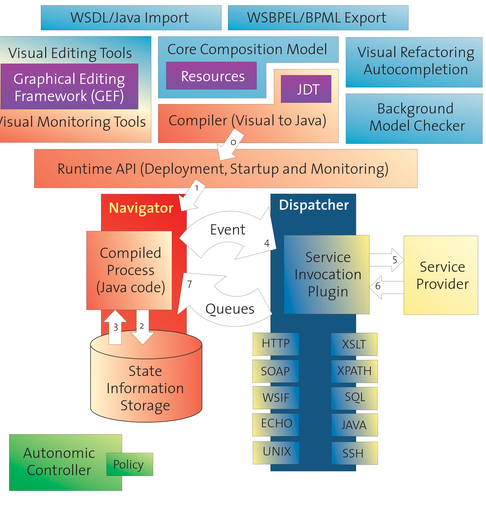
- Combine efficiently coarse-grained Web Services with fine-grained Java Snippets



- JOpera provides an extension point for service invocation plugins for calling different kinds of services using the most efficient, secure, reliable and convenient mechanism

A Flexible Architecture for Autonomic Process Execution





Main Deployment Scenarios

- Stand-alone, integrated rapid composition environment based on Eclipse user experience
- Client/Server: Local RCP monitoring tools connects to remote runtime execution platform
- Runtime execution platform can be deployed on a cluster of computers. We are developing an **autonomic** controller to automatically set the optimal cluster configuration in response to workload changes