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# *Case Study in Tourism:*

# *F.E.T.I.S.H.*

*(Federated European Tourism Infrastructure System Harmonization)*



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Herzum Software

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# The F.E.T.I.S.H. Initiative

*(Federated European Tourism Infrastructure System Harmonization)*

*An Intelligent Environment for Interoperable Value Added Services and Systems*

- **The value proposition of F.E.T.I.S.H.**
  - **Connect information systems (an Internet-based service bus) and Value Added Services (VAS) into a community where a critical mass of European resources and data can be shared over a network across a wide geography**
  - **A Reference Service Network that will create a competitive advantage in the travel service provider market**
- **The vision:**
  - **To be a leading supplier of distributed service solutions, which will provide tourism information and service integration.**
  - **By using a Service Oriented Architecture, F.E.T.I.S.H. gives to VAS providers a high-level, open architecture model that supports the production of reliable, platform-independent services**

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# Main Objectives

- Establish the required infrastructure for supporting spontaneous network of tourism-oriented services.
- Supporting nomadic Tourists
- Offer Services carriers
- Share services
- Access and run services anywhere
- Support multi hardware, PDA, Cellular Phones, PC, GPS...
- Providing guidelines and facilities on how to adapt them to the FETISH environment
- Be a Cluster Project to allow
  - Allow external non a priori known tourism projects to join the Federation and add Information Contents

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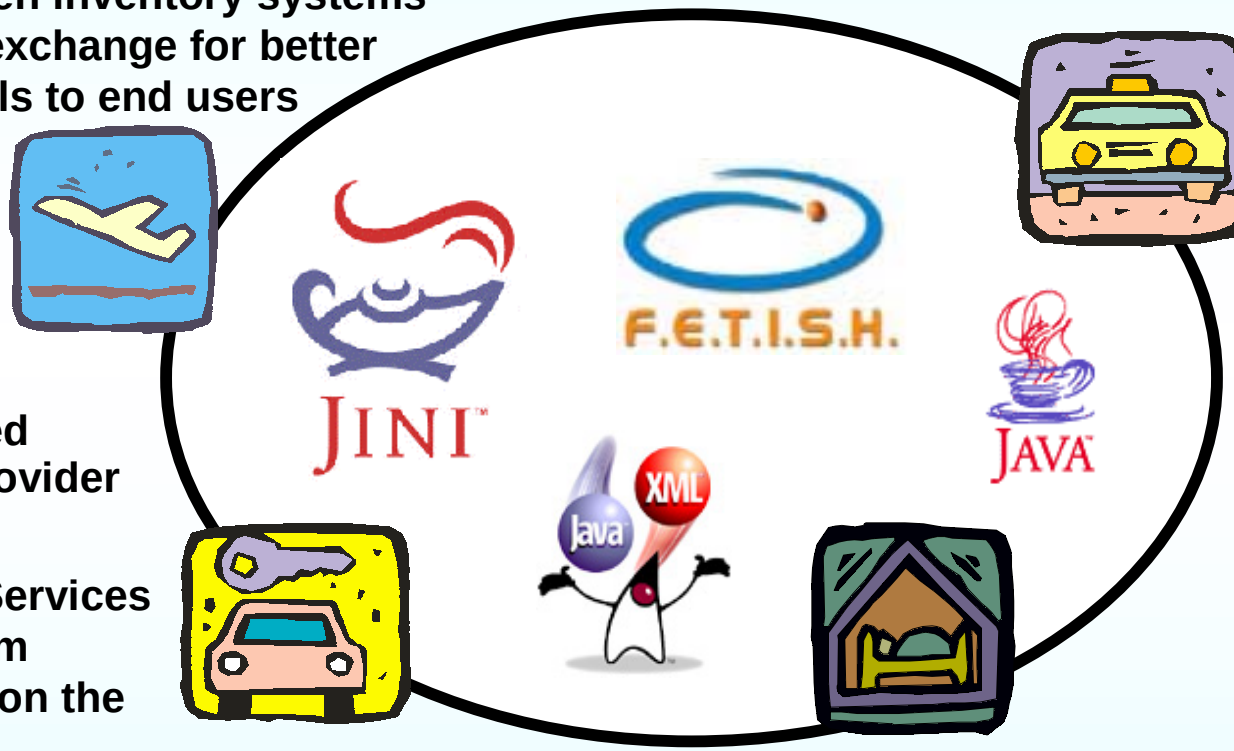
# FETISH Virtuous Circle

**Information provider**

**Open inventory systems in exchange for better tools to end users**

**Basic Service Provider**

**Application are shared with suppliers to provide value added services**




**Value Added Service Provider**

**Combined Services are built from component on the federation**

A business dial tone will be provided to service integration

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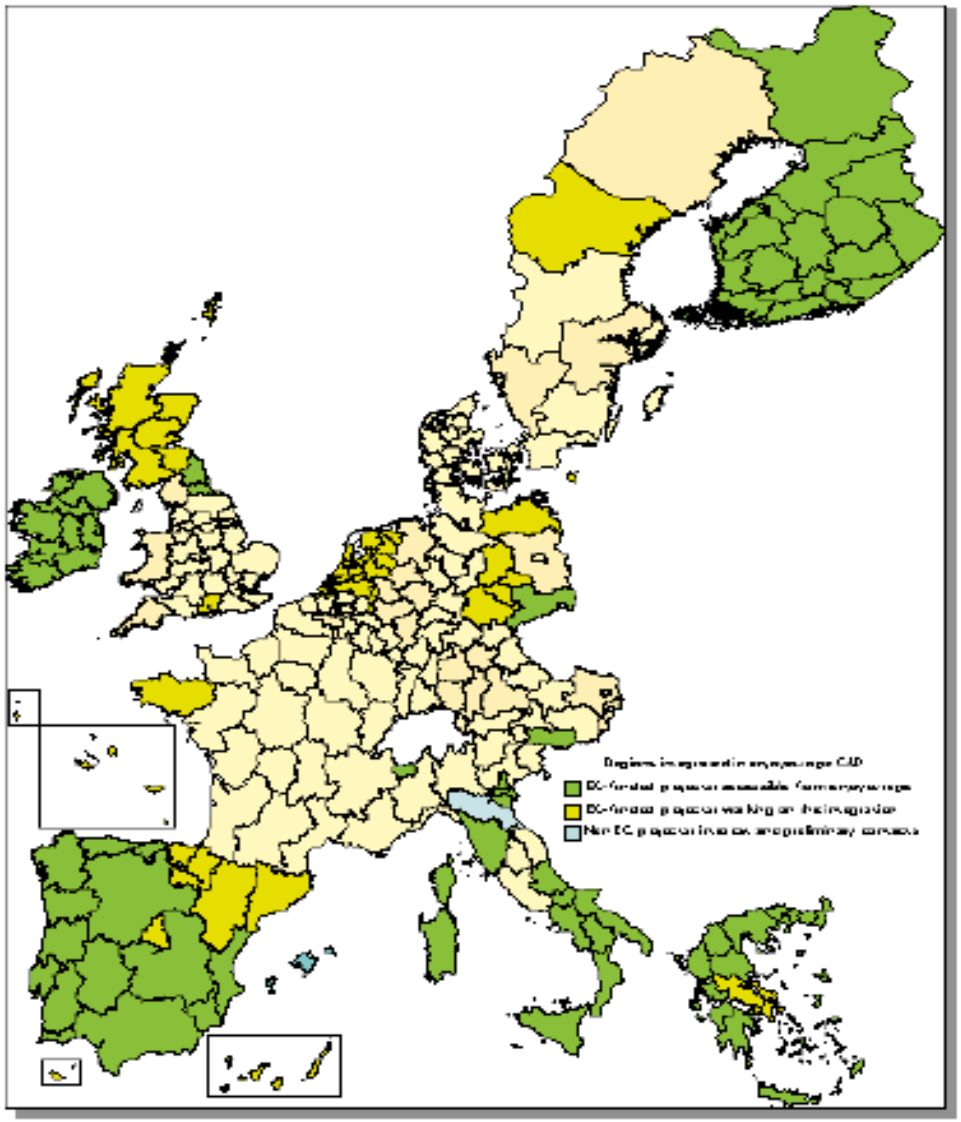
# What kind of Services?

- Terminal agent
- Positioning Agent
- Modeling Agent
- Service Broker Agent
- Offer Agent
- Direct and reverse auctioning manager
- User Profiling
- Intelligent push of Information
- Reservation Engine
- Map, GIS services
- Itinerary generator
- Fidelity programs
- Payment

# Where does data come from ?



- Green and yellow regions will provide tourism information or link their system to the Fetish Network.
- Information is available now by a search engine (www.enjoyeurope.com)
- but will be used  by any VAS. service-application

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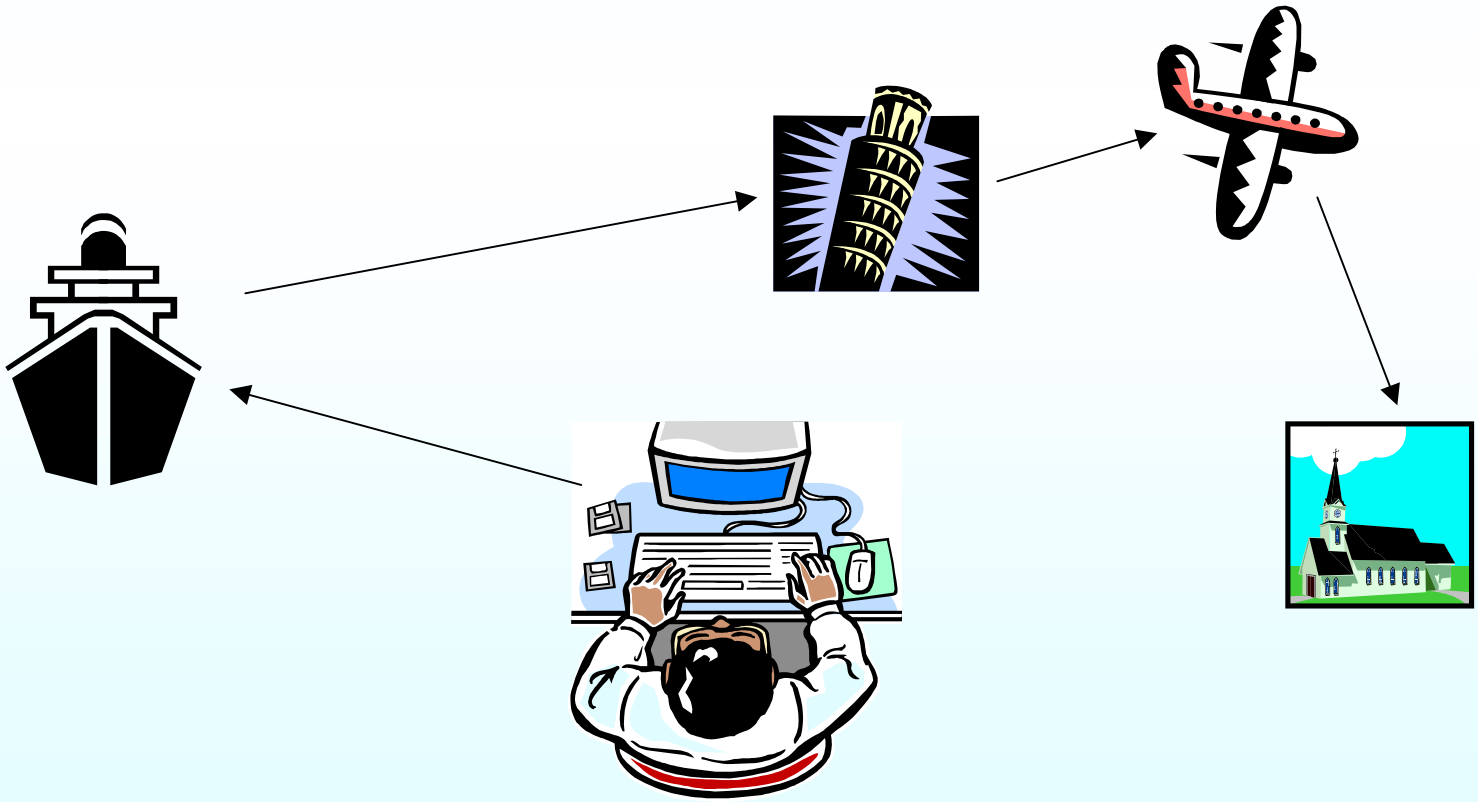
# VAS and VE

- **Implementation of the Infrastructure to support the integration of the existent tourism value-added services**
- **Allow Tourism Agency clerks to use a user friendly application that search, retrieve and link world wide distributed Services**



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# F.E.T.I.S.H. Challenges

- To develop a platform infrastructure to accommodate constantly changing environments and for supporting spontaneous network of tourism-oriented services
- To integrate the fragmented tourism information systems and the IST-based value-added services, in a federated distributed community of resources
- To build a community where processes and services will be shared over a widely available tourism network
- Institute interoperable technology to connect to wired and wireless services and applications
- Supporting Citizens plugged-in:
  - Offer Service
  - Access and use service
  - Share and combine services
- Implementation of an infrastructure to support the integration of the existent tourism value-added services, providing guidelines and facilities on how to adapt them to the FETISH environment
- Harmonization in the Tourism Domain!

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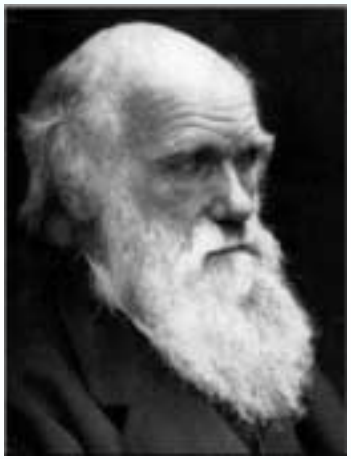
# Creating Digital Darwinism



*Charles Darwin 1809 - 1882*

*“It is not the strongest of species that survive, nor the most intelligent, but the one most adaptable to change."*

*"We are creating digital Darwinism:*
*a service that is able to evolve as the users need it to."*
*A.Nicolai FETISH Project Coordinator*

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# Partners

- Herzum Software, Italy: www.herzumsoftware.com
  - *Technical and Architectural Coordination*
- SUN Microsystems, Spain: www.sun.es
  - *Distributed infrastructure*
- T6, Italy : www.t6.it
  - Program Management
- Herzum Software, Italy: www.herzumsoftware.com
  - *Repository*
- IASI-CNR, Italy: www.iasi.it
  - *Ontology*
- ICEP, Portugal: www.icep.pt/english
  - *Tourism Expertise*
- Uninova, Portugal: www.uninova.org
  - *Business Process & Workflow Definitions Tool*
- New Trade Tech, Canada: www.ntt.ca
  - *Service Provider, beta tester*
- Forthnet, Greece: www.forthnet.com
  - *Service Provider, beta tester*

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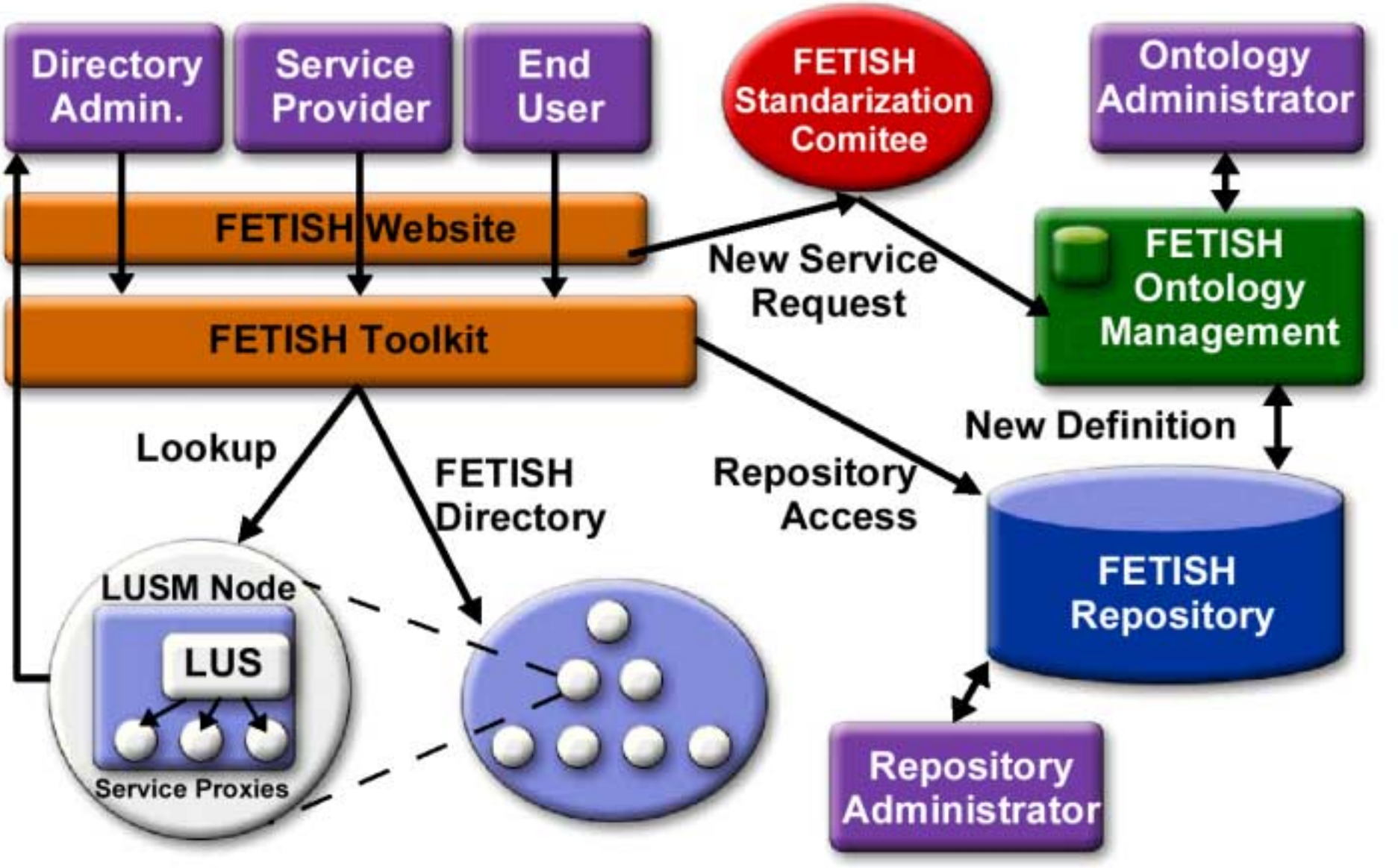
# Foundation Model (Platform Focus)



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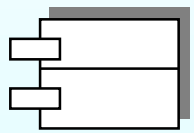
# System Level Components

- F.E.T.I.S.H. Repository (Herzum Software, Italy)
  - Business Component System
  - Service Definition Catalogue
  - Business Data Type Definition Catalogue
  - Service Modeler
  - Federated Access Resource Manager
- FADA, Fetish Advanced Directory Architecture (SUN, Spain)
  - Discover, Lookup & Join Services
  - Toolkit
  - Jini/XML-RPC Based
  - GUI/Text Admin Tool
- Symontos (IASI-CNR, Italy)
  - Ontology System
- PROMAN (Uninova, Portugal)
  - “value added client”
  - Design Work Flow (WF), link Basic Services
- FCA, Fetish Certification Authority (SUN, Spain)
  - Define Participants identify and authorizations



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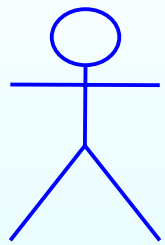
# Actors

- F.E.T.I.S.H. Provider
  - Provide tourist services
  - Implement proxies for accessing services
  - Can wrap the proxy in a VA service (i.e. website)
- F.E.T.I.S.H. Client
  - Retrieve the proxies to gather access to service
- Generic F.E.T.I.S.H. User
  - Use an application/Web Site that wraps a F.E.T.I.S.H. proxy
- F.E.T.I.S.H. Committee
  - Define/maintain ontology
  - Define/maintain FETISH repository
  - Define policy criteria for accessing F.E.T.I.S.H.



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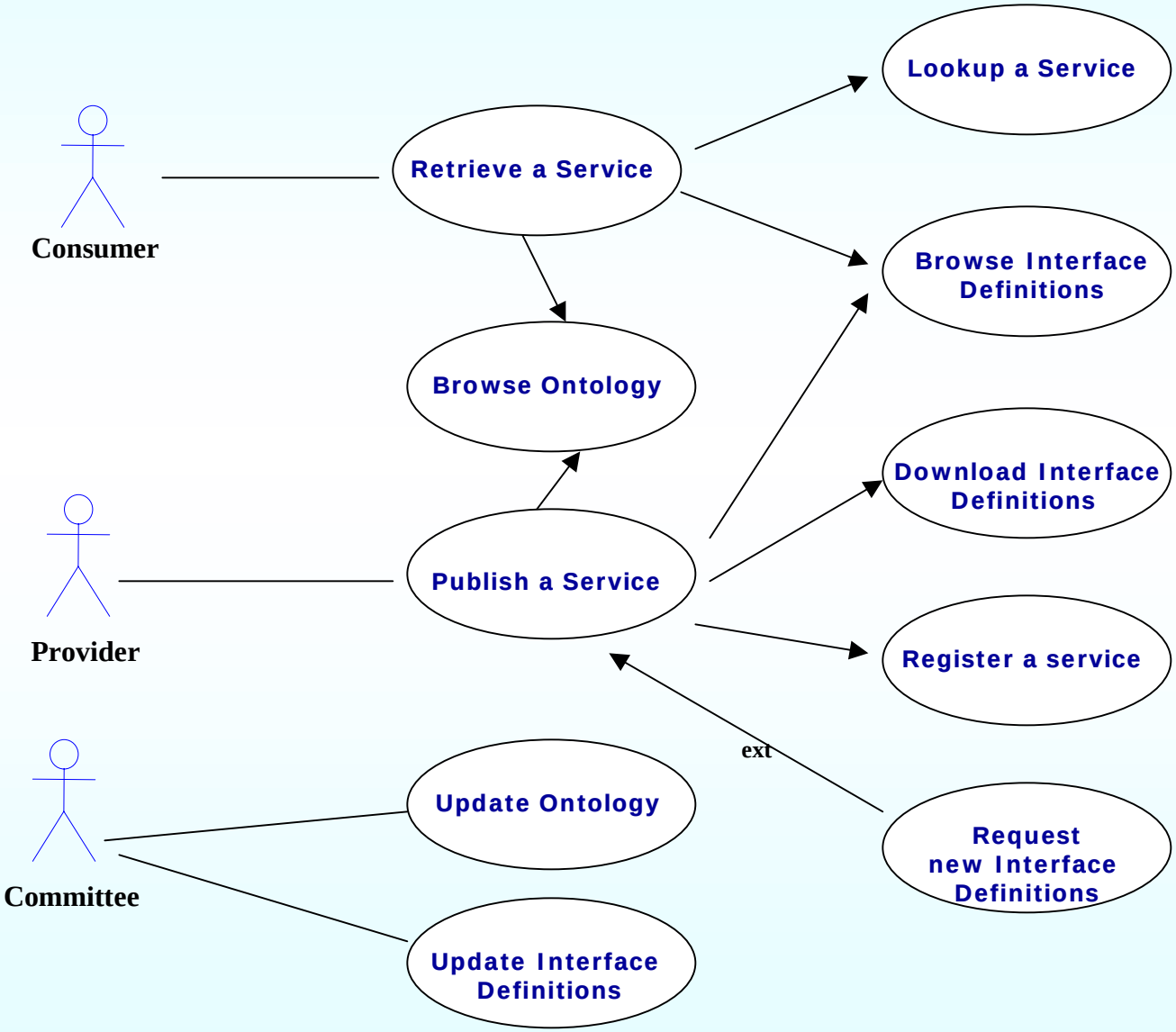
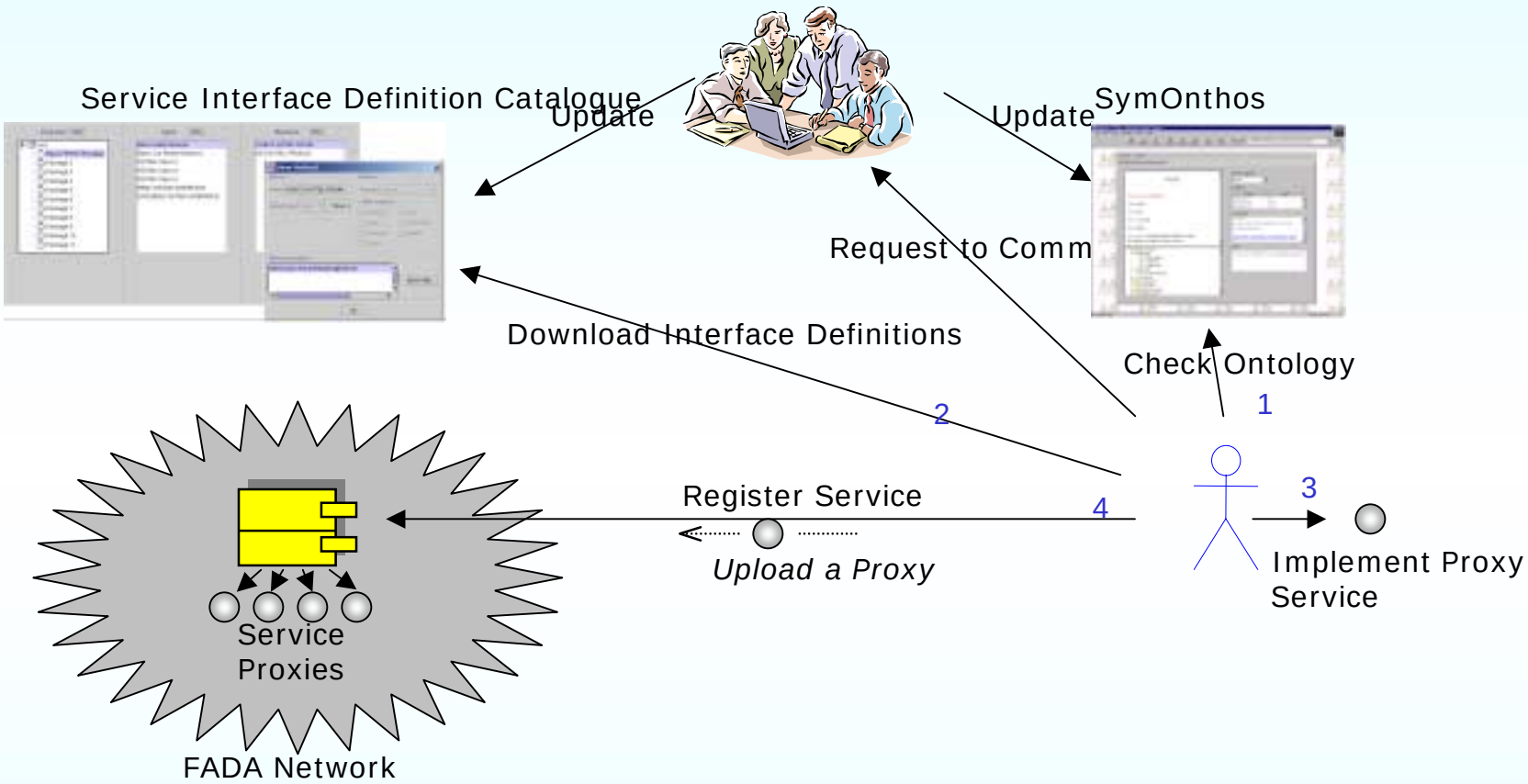
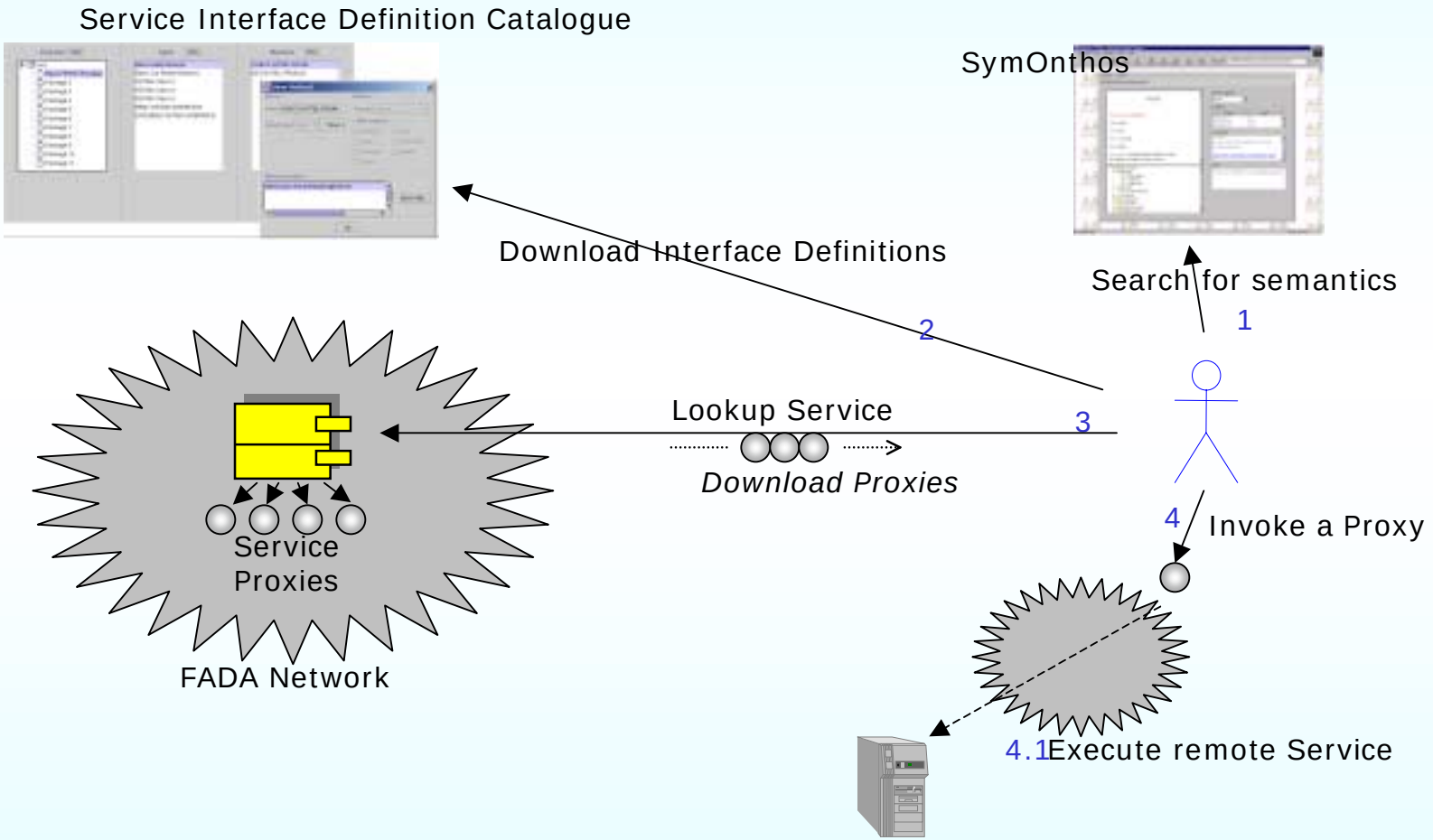
# FETISH Use Case



# Use Case: Publish a Service



# Use Case: Retrieve a Service



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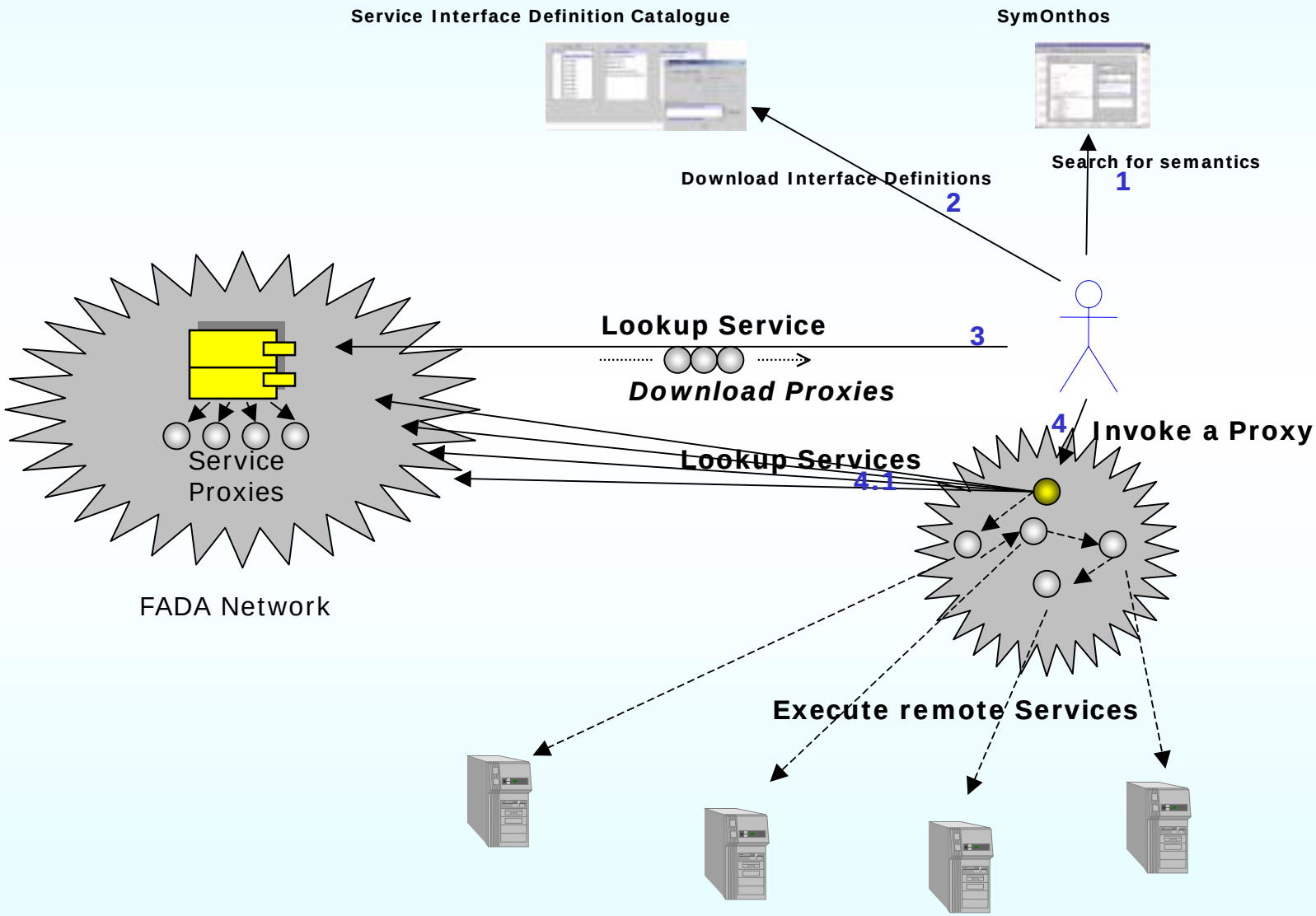
# Use Case: Execute a VAS



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# Adopted Strategies

- "The network is the computer"
  - Avoid "single point of failure"
  - "high availability"
- "Distributed Computing Architecture"
  - Component Oriented Software Manufacturing (COSMTM) approach
  - Hide Complexity
- "Service Oriented Architectures"
  - Provide run-time interfaces at any level
- Be the first user of our own infrastructure
- Open source project
- 100% Java Code
- Apply public and standard specifications
  - WSDL, XML-RPC, WFDL, XFORM,…
- XML as a "lingua franca" for intra/extra net F.E.T.I.S.H.

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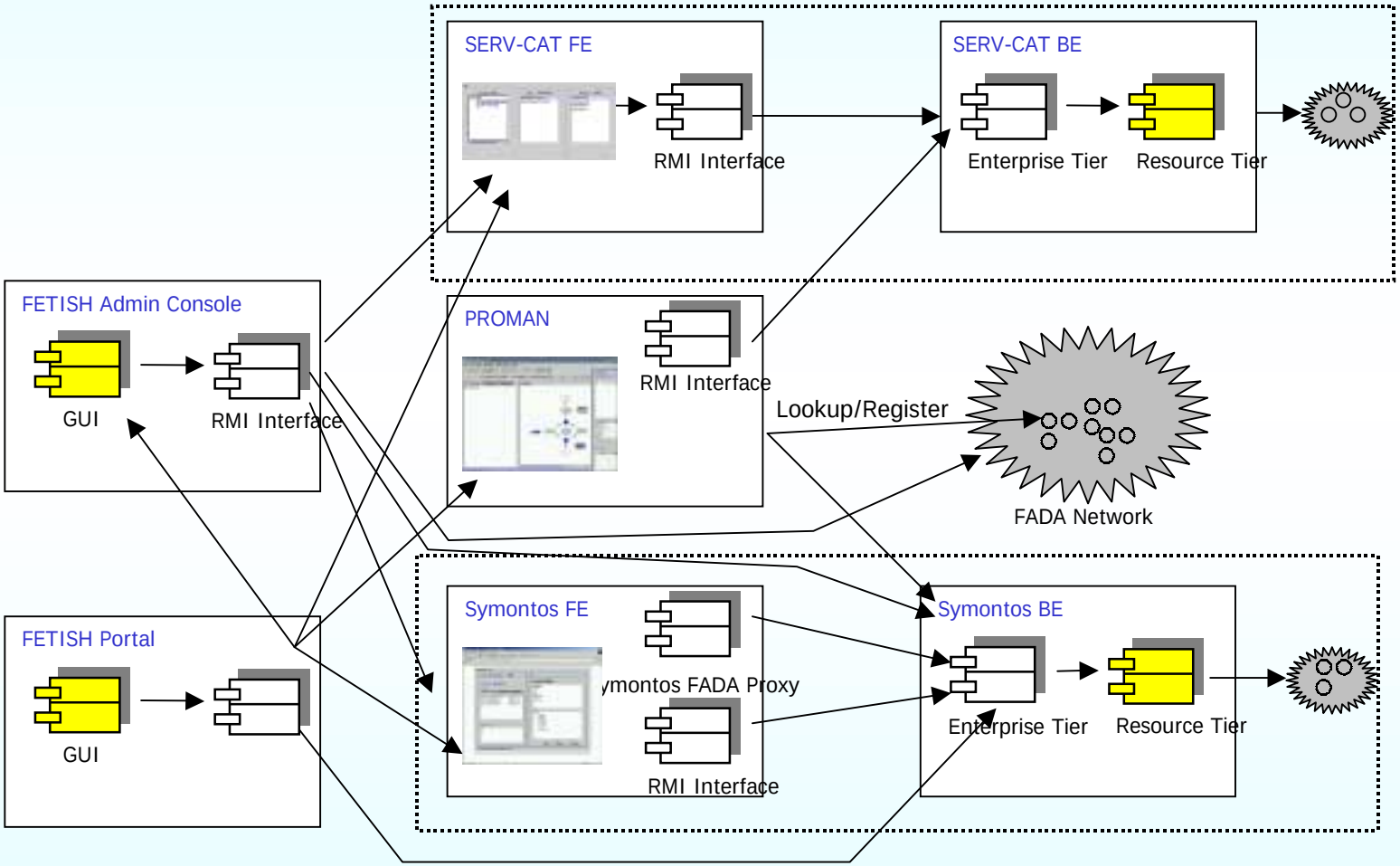
# Component Model



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# *Repository*

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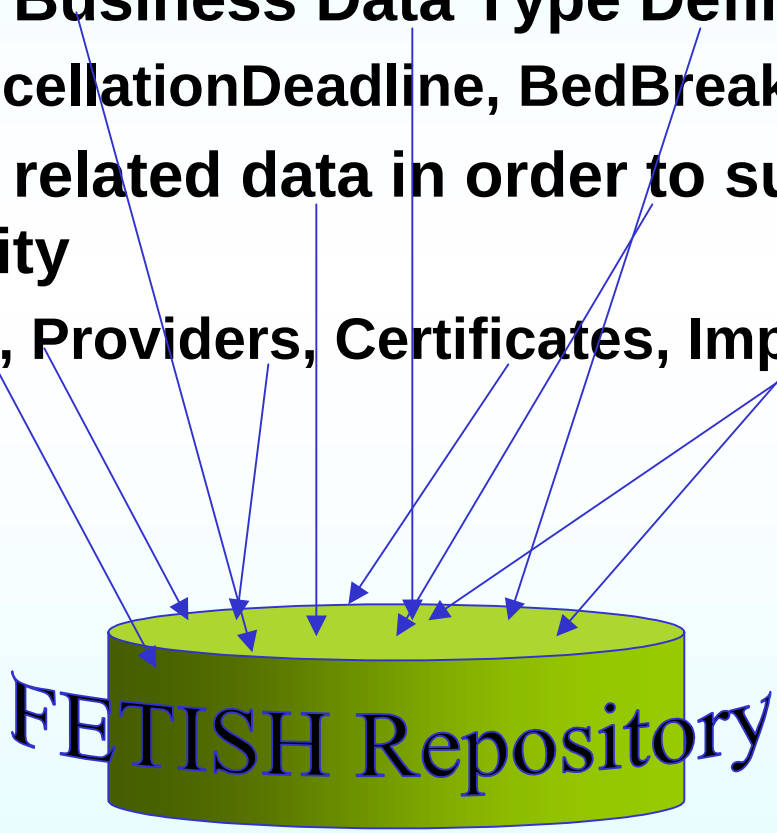
# What is it?

- Catalogue of Interface Definitions (verbs/actions)
  - Hotel Reservation, Car Rental, Theater Booking, Cancel,…
- Catalogue of Business Data Type Definitions (nouns)
  - Room, CancellationDeadline, BedBreakfast
- Catalogue of related data in order to support interoperability
  - Customers, Providers, Certificates, Implementation Instances



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# Repository Key Points

- Information Manager of F.E.T.I.S.H.
- Analysis and design of federated information mechanisms to support the requirements of Virtual Enterprise (VE) applications
- Management of metadata catalogue information to support standard interoperation among F.E.T.I.S.H. service providers/users
- Define visibility access levels for each services
- Export service definitions in WSDL and Java interface
  - Runtime transformation

# Information Management Requirements

- **Information Management Requirement Analysis for VEs in F.E.T.I.S.H.**
- **Service Interface Definitions Catalogue components**
  - **Application servers for Service/Data Interface Definitions catalogue**
  - **Interfaces:**
    - ***Web server, the FETISH Project Portal***
    - ***Runtime, FADA Proxy***
- **Federated Access Rights Manager (FARM)**
  - **Allows the definition and validation of visibility / access rights to service proxies both in general and within VEs**
- **FETISH Business Data Types**
  - **Including service providers profiles, end-user information, VE topology, etc.**
- **The FETISH Administration Console (part of the Federated Information Management System)**

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# Different Kinds of Services

- There are many different kinds of services that require different access levels
  - Public services to be used by any customer
  - Customized services offered based on mutual trust relationships
  - Services within a VE, offered to other VE partners may be merged in a VAS
  - Composed VASs may be offered only to a select group of collaborator enterprises (e.g. specific travel agencies)
- The concept of service provision contracts and liabilities within a VE (supported by VASs) may need to be reinforced
  - Selective access rights is important to maintain trust among VE partners

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# *Directory Service*

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# What is FADA?

- With respect to the conceptual framework, FADA realizes a Distributed Network Technology
- Implements the webservice Transportation Bus Layers
  - Proxy distribution BUS
- Self-healing, self-adapting
- Operations:
  - `Register()`
  - `Lookup()`
- Build on top of Jini but significantly improving efficiency, current v4.0.1 addresses:
  - Lookup algorithm
  - Security & authentication
  - The “Firewall issue”: RMI replaced with XML-RPC over HTTP
  - HTTP Proxy aware
  - Adaptive Lease renew triggering

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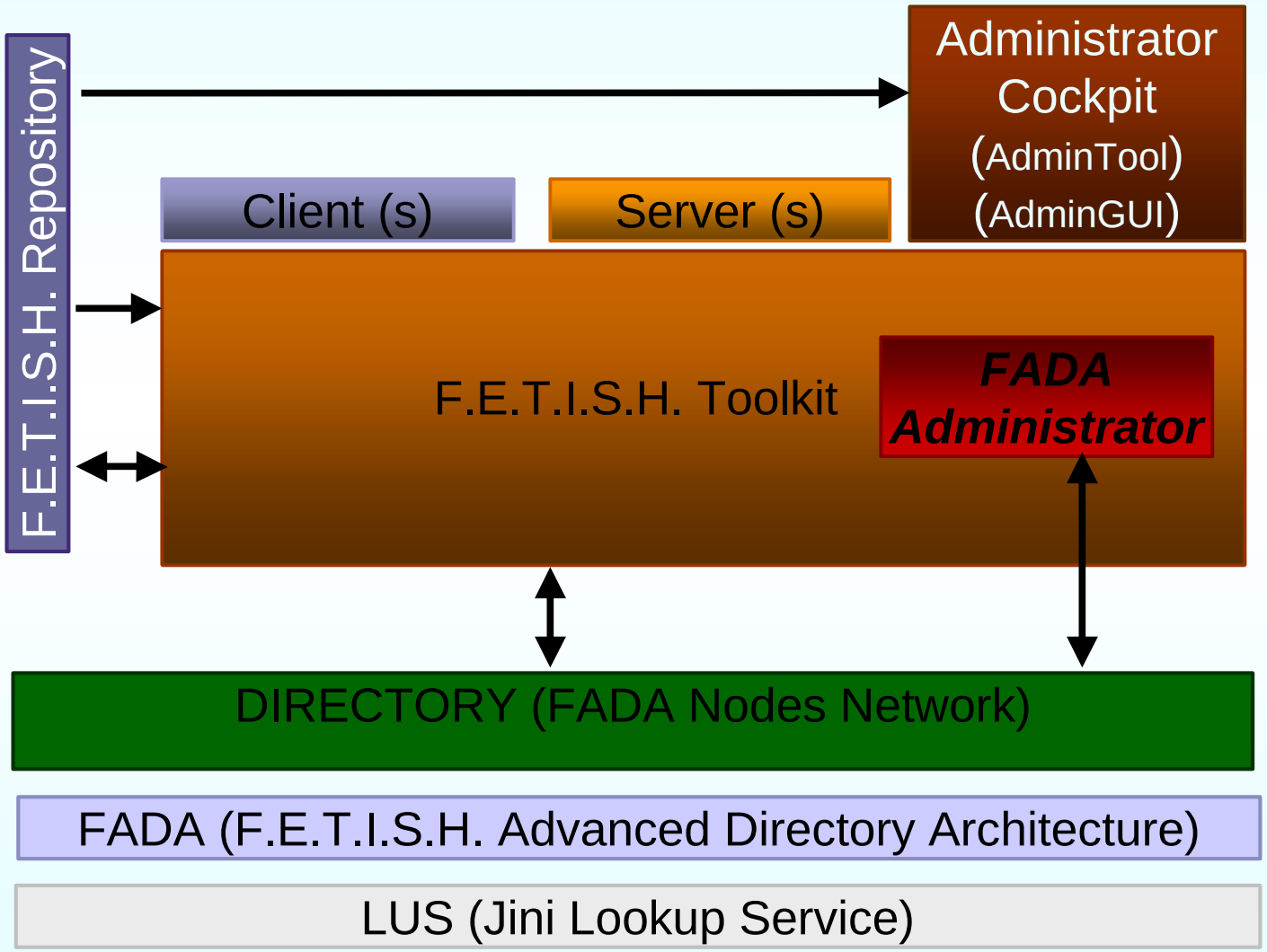
# FADA Architecture Elements



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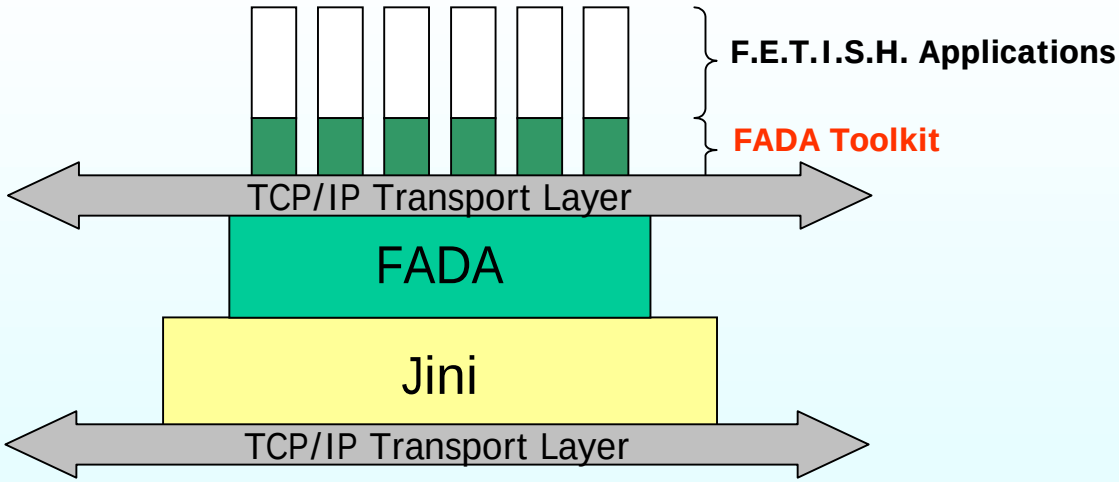
# F.E.T.I.S.H. Toolkit

- It is the Java F.E.T.I.S.H. Framework
- It's purpose is to ease the development of a F.E.T.I.S.H. proxy
  - A Consumer is able to use services, in it's system, with a minimum efforts, no Jini expertise needed
  - A Provider is able to publish it's system with minimum effort
  - A Provider is able to access F.E.T.I.S.H. infrastructure
- It sits on top of FADA



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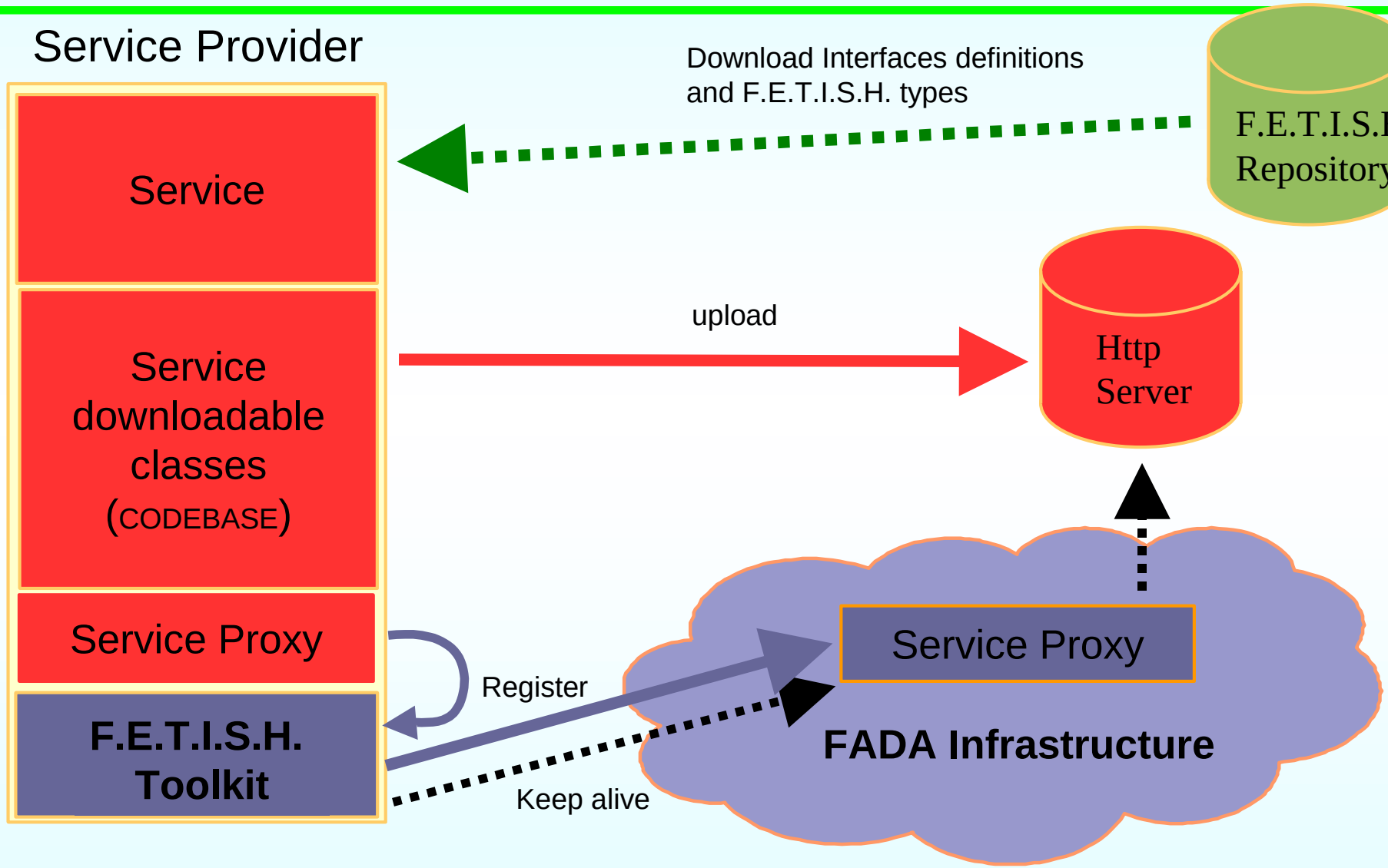
# Registering a Service



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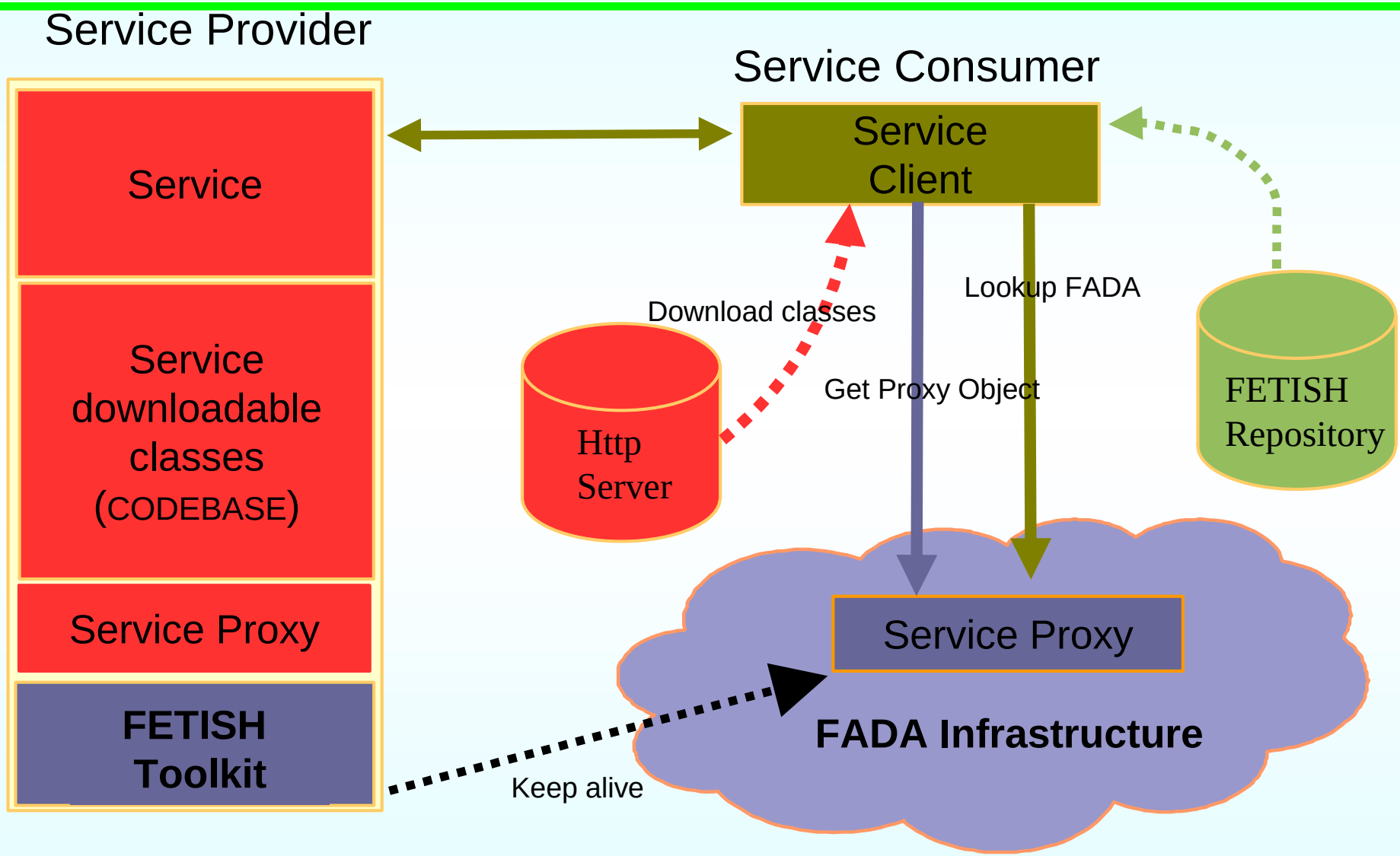
# Using a Service



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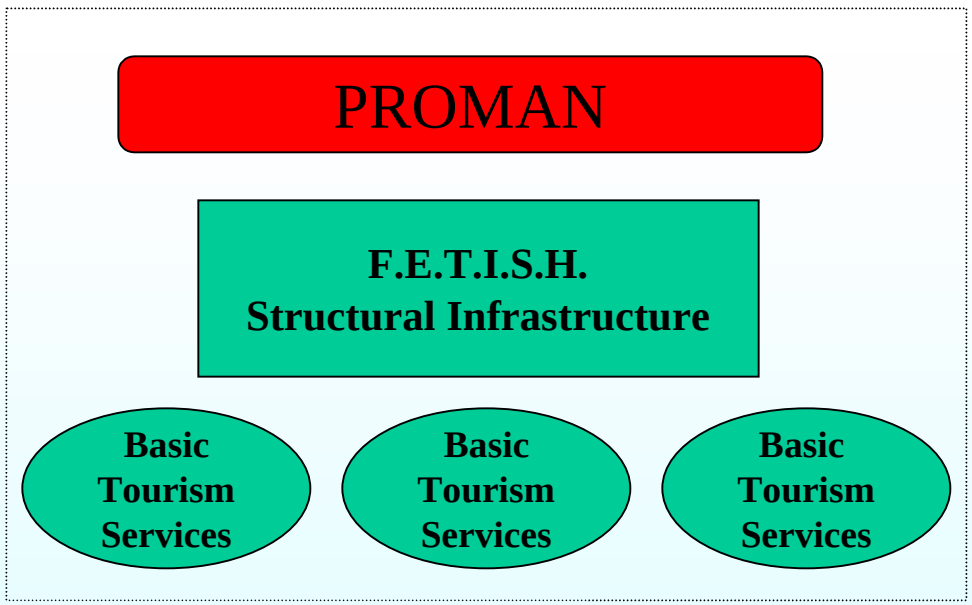
# *Business Process Modeling (A Value Added Client)*

# Solution

- **PROMAN as the solution to solve VAS and WF Modeling**
  - **Uses the F.E.T.I.S.H. architecture**
  - **Extends the functionalities of F.E.T.I.S.H. composed of basic services**

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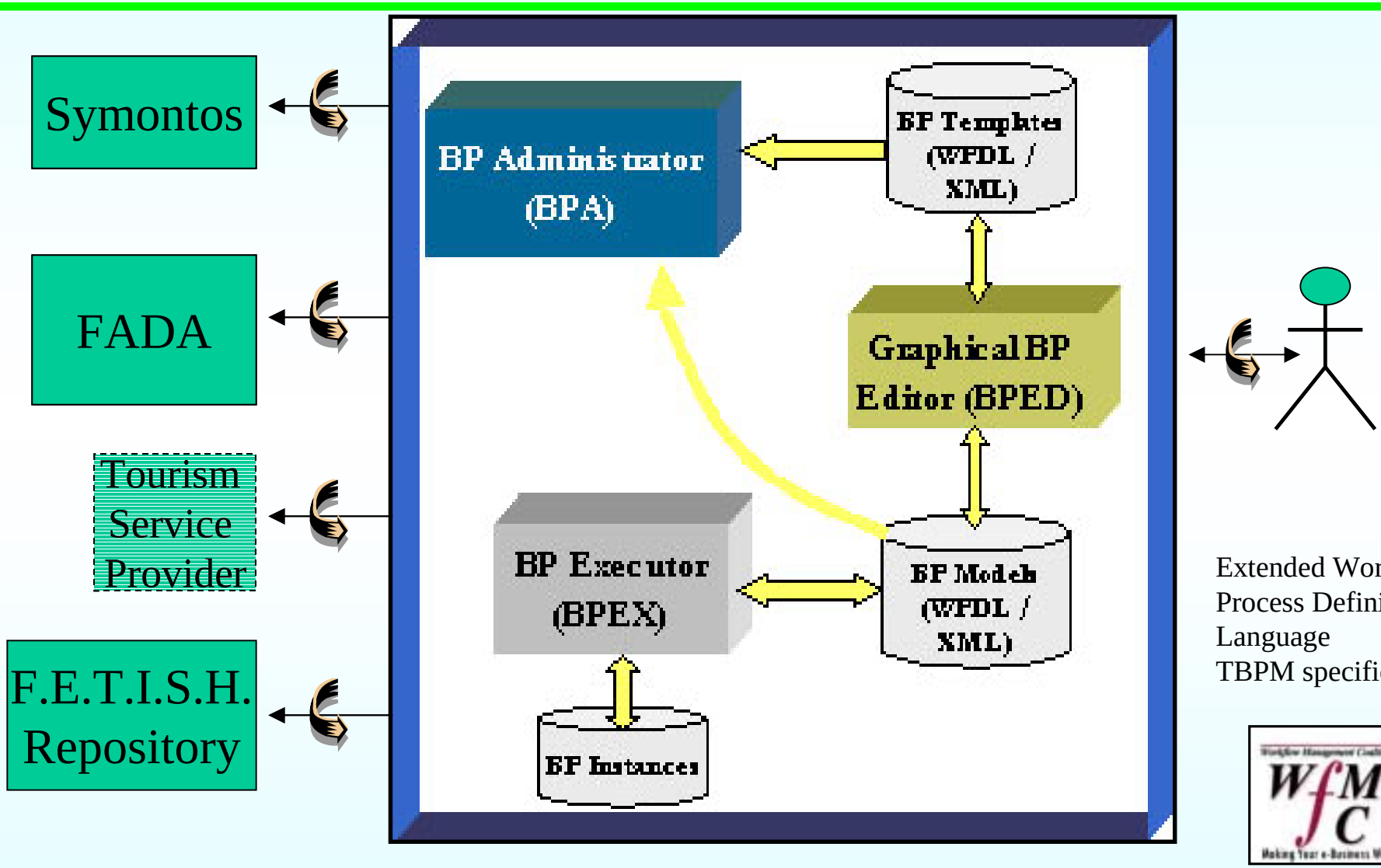
# PROMAN System

- Creation/Edition of VAS / WF Models
- Execution of remote services in chain (workflow)
  - Remote J2EE executor engine
- Not a technical expertise needed (no Java, XML, FADA, Jini) to define VAS
- RunTime edition:
  - Evaluate conditions
  - Execution monitoring
  - Watch facility
  - BreakPoint facility
- Build on top of the F.E.T.I.S.H. infrastructure:
  - Linked with ontology component
  - Linked with FETISH repository
  - Linked with FADA
- VAS is automatically provided as simple services

# Global Architecture




Extended Workflow Process Definition Language
TBPM specification

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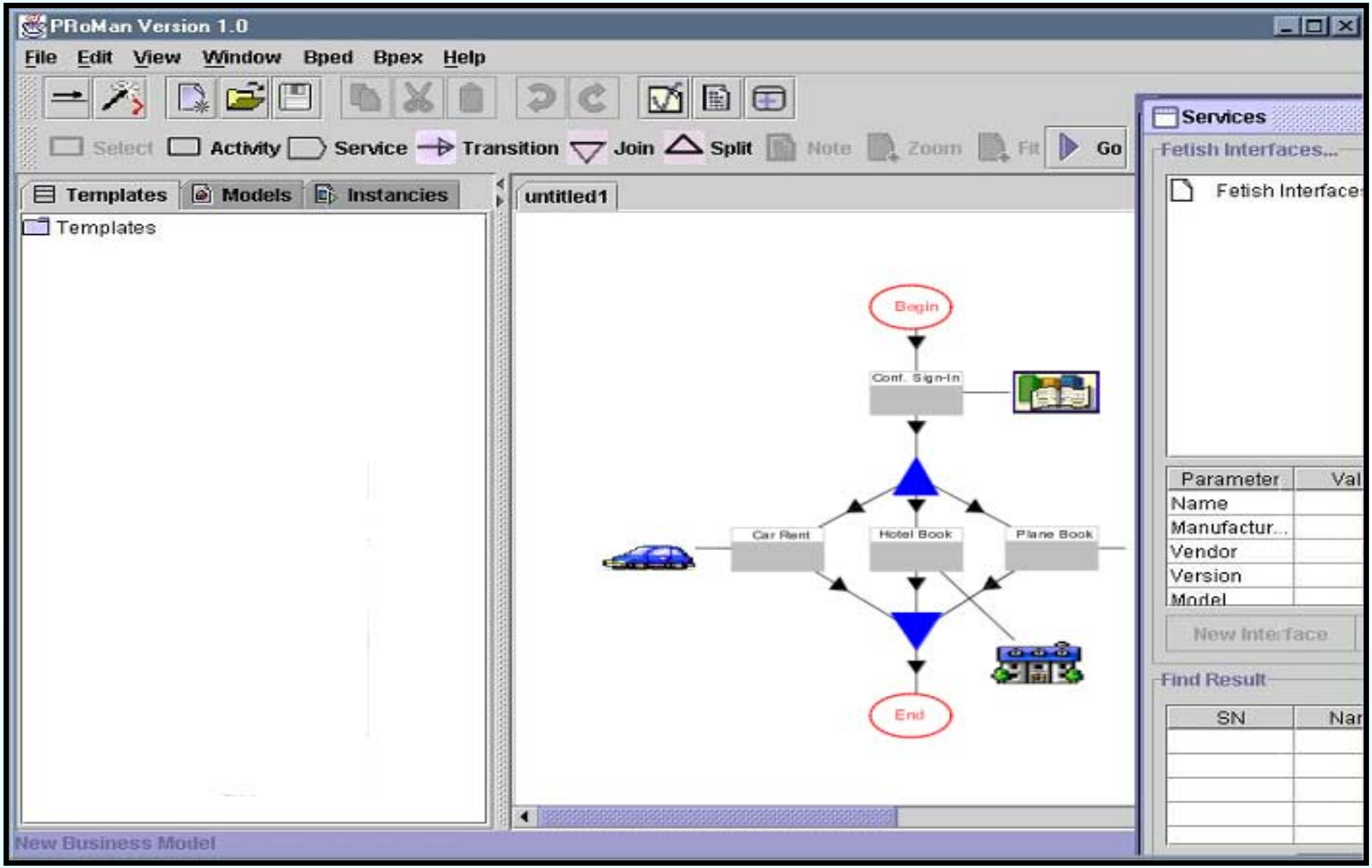
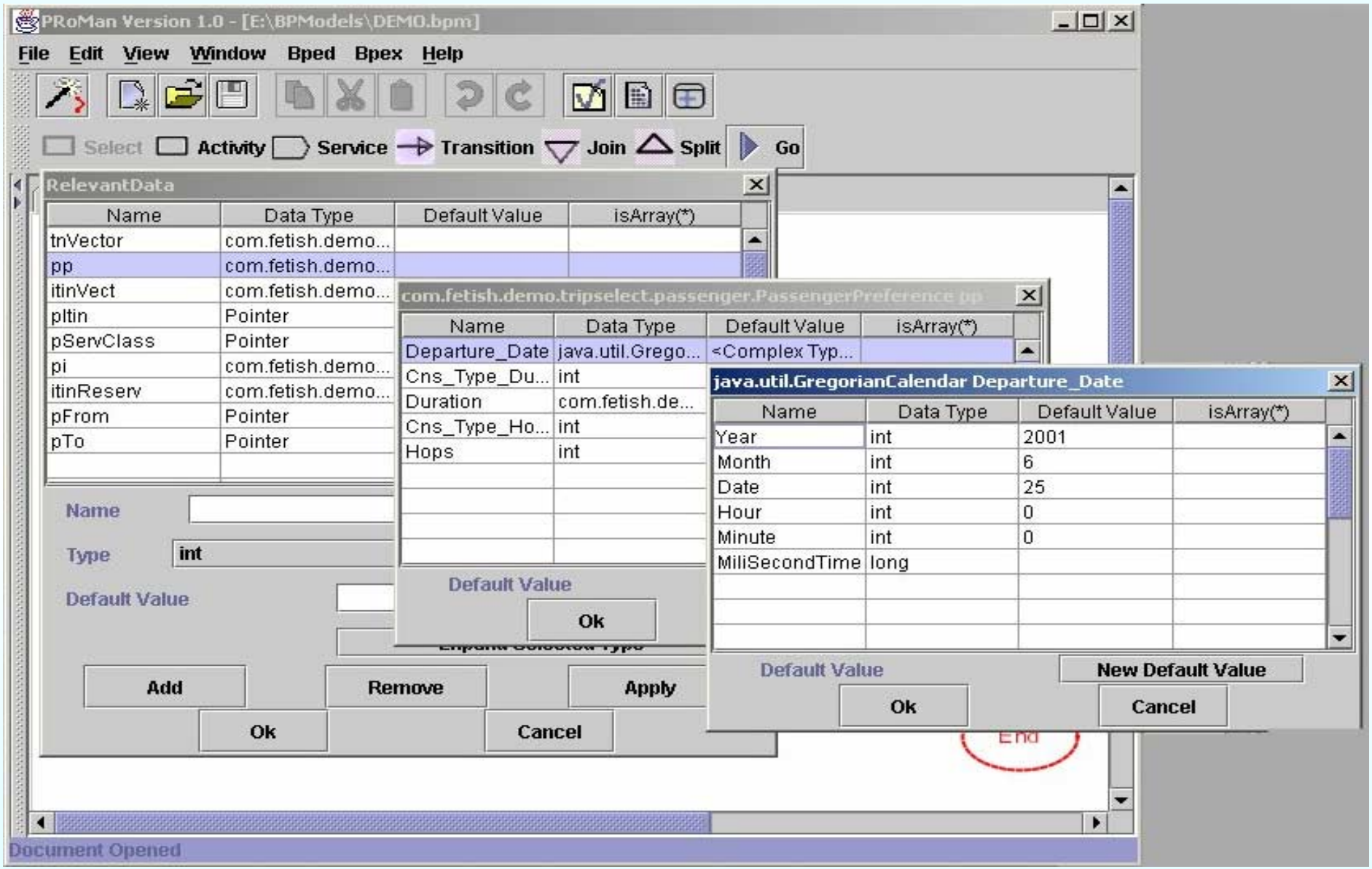
# Example: WF Editor



# Example: BDT Mapper



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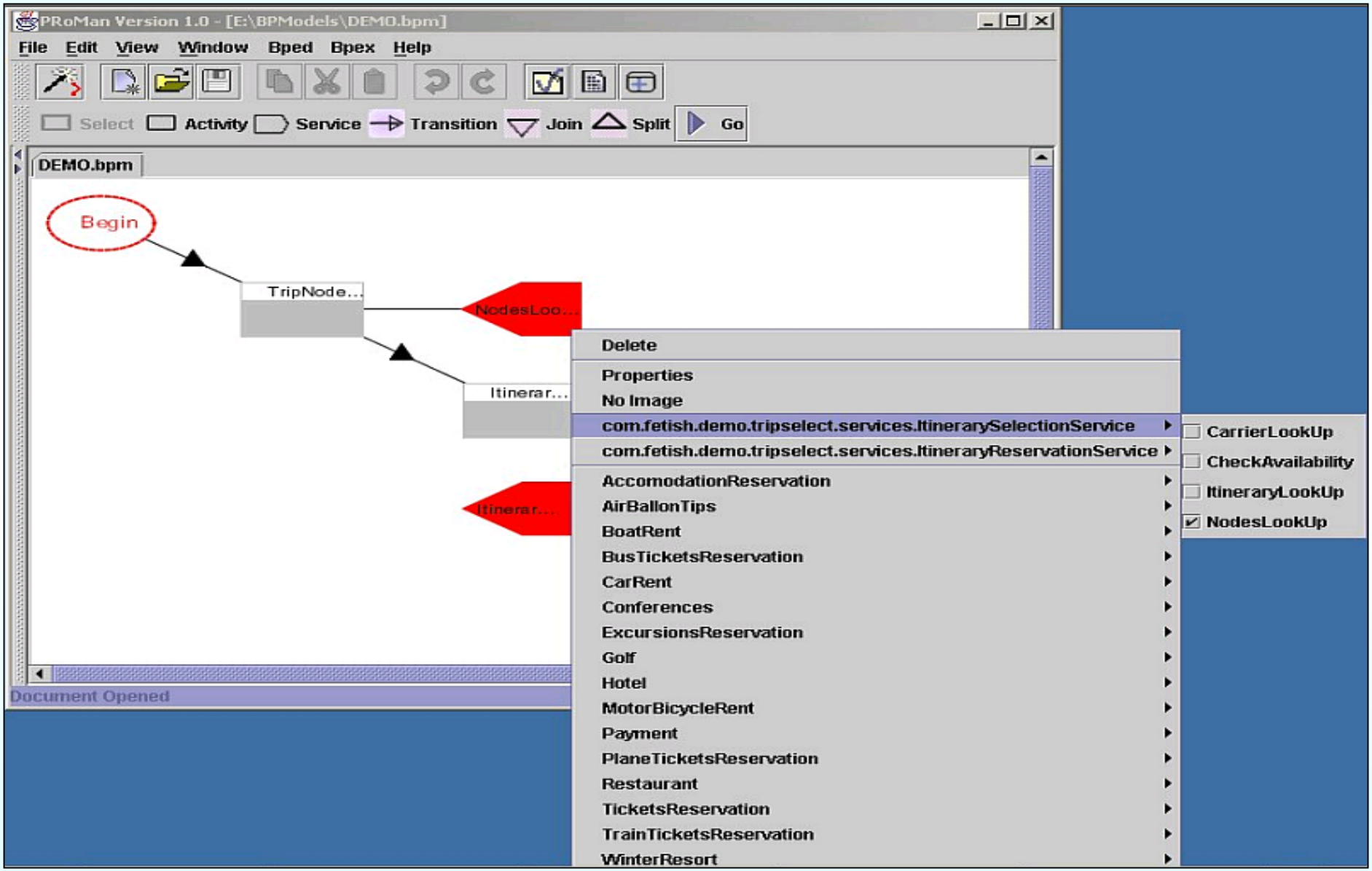
# Example: WF Executor



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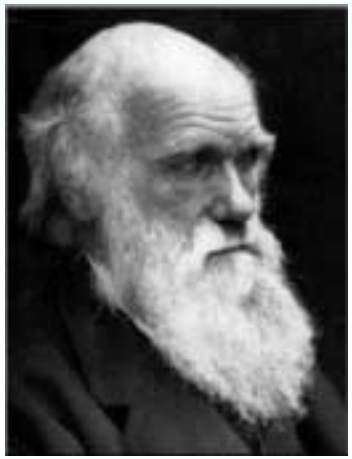
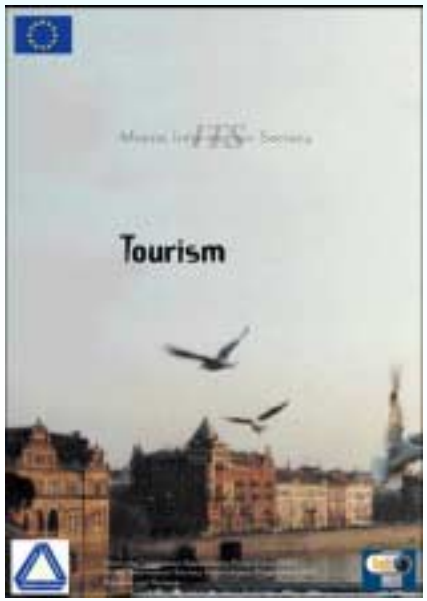
# Q&A



*Charles Darwin 1809 - 1882*





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*A.Nicolai, FETISH Project Coordinator*

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# *References*

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# FETISH References

- Fetish is the world's 3rd largest implementation of a distributed computing architecture using Jini technology
- Our presence was requested at JavaOne, 7th June 2001 in San Francisco!
- Fetish has been chosen by Sun Microsystems as a world reference case for advanced distributed computing architecture
- Agreement of cooperation with German Space Agency for Nomadic Services distribution
- Public results, open source model, offers support services to vertical research projects



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# Standards & Organizations

- COSM: www.componentfactory.org
- F.E.T.I.S.H.: www.fetishproject.com
- Jini: www.jini.org
- UI Services: www.artima.com/jini/serviceui/Spec.html
- XForm: www.w3.org/TR/2001/WD-xforms-20010608
- OPAL: Object, Process and Actor modeling language
- WSDL: www.w3.org/TR/wsdl
- XML-RPC: www.xmlrpc.org
- WFMC: www.wfmc.org

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# Relevant Websites

- www.componentfactory.org
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