Generic Supplier Infrastructure for Windows Applications

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Agenda
- Project Overview
- Design
- Implementation
- IESupplier – Web Browsing Service
- Future Work
Project Overview

- Prism (Task Manager)
  - automatic marshalling
  - context awareness
  - QoS monitoring
  - adaptation policies
  - privacy policies

- EM (Environment Manager)
  - service discovery
  - resource management
  - automatic re-configuration
  - distributed file access

- Supplier (Service Wrapper)
  - abstract service registration
  - adapted service
  - state capture and restoration
  - QoS report

Scenario

<table>
<thead>
<tr>
<th>Step</th>
<th>Message</th>
<th>Message Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Register</td>
<td>Supplier → Environment Manager</td>
</tr>
<tr>
<td>2</td>
<td>Activate</td>
<td>Environment Manager → Supplier</td>
</tr>
<tr>
<td>3</td>
<td>ackActivate</td>
<td>Supplier → Environment Manager</td>
</tr>
<tr>
<td>4</td>
<td>taskLayout</td>
<td>Environment Manager → Prism</td>
</tr>
<tr>
<td>5</td>
<td>setState</td>
<td>Prism → Supplier</td>
</tr>
<tr>
<td>6</td>
<td>QoSReport</td>
<td>Supplier → Environment Manager</td>
</tr>
<tr>
<td>7</td>
<td>getState</td>
<td>Prism → Supplier</td>
</tr>
<tr>
<td>8</td>
<td>stateSnapshot</td>
<td>Supplier → Prism</td>
</tr>
<tr>
<td>9</td>
<td>Disband</td>
<td>Prism → Environment Manager</td>
</tr>
<tr>
<td>10</td>
<td>Deactivate</td>
<td>Environment Manager → Supplier</td>
</tr>
</tbody>
</table>
Design Constraints

- Asynchronous Peer-to-Peer Communication
- Parallelism
- Portability
- Extensibility
- Abstraction and Encapsulation

Design Strategies

- Division of responsibilities into 2 groups
- Separate connectors for handling peer-to-peer communication between Supplier and EM/Prism
- Separate sockets for sending and receiving of messages
- No explicit acknowledgement of the receipt of messages
- Parallel reading and processing of messages
AuraSupplier

- Generic Functionalities of a Supplier
- Provide common communication interface to Prism and Environment Manager
- Receive and process incoming messages
- Offer standard supplier functions
  - register, activate, deactivate, getState, setSate, and QoSReport
ABC Supplier

- Specific Functionalities of a Supplier
- Provide wrapper interfaces to specific applications
  - openApp
  - closeApp
  - capture
  - restore
  - loadSettings
  - saveSettings

Implementation

- Programming Language – C++
- Development Environment – Microsoft Visual C++ 7.0
- Simulation Environment – Prism-EM Stub Package Provided by Vahe
- Code Reused
  - xmlDragon Library
  - xmlNavigator Class
IESupplier – Web Browsing Service

- WebBrowser ActiveX Control
- IWebBrowser2 Interface
- Settings and Preferences Supported
  - URL location
  - Application settings: address bar, menu bar, status bar, and toolbar
  - Display settings: full-screen or normal window mode, resizable
  - Position settings: the screen coordinates of the main window of Internet Explorer
  - Size settings: the width and height of the main window of Internet Explorer

Future Work

- Support of multiple services
- Support of multiple materials for each service
- Support of comprehensive QoS report
- Support of connection of multiple suppliers
- Integration of more powerful functionalities of Windows applications into the Aura system
Questions?