Chapter V

Service-Oriented Design Process Using UML

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Abstract

This chapter presents a worked example of a design process for Service-Oriented Architecture. It utilizes the industry standard modeling notation, the Unified Modeling Language (UML) from the Object Management Group, to present a practical design for services. The authors have used their real world experience on many service-oriented projects to develop a design method using visual modeling to implement high quality services and service implementation. The chapter introduces a terminology for services and their implementing components and then works through the example to show how the implementation is designed in UML. We hope that this will show the reader how services are implemented by organizations on real projects.

Introduction

We have been assisting organizations to use Component-Based Design and Development to implement Service-Based Architecture for over seven years, utilizing the Select Perspective development process and the principles of the Supply, Manage, and
Consume Model for Web services and dependent components. Web services are a natural development from components, which in turn were a natural development from OO. We have leveraged the power of the Object Management Group’s Unified Modeling Language (UML) to analyze and specify the services within a Service-Oriented Architecture.

In this chapter, we intend to initially present the difference in terminology from the Component View of the world and the Service view of the world. We will then present a worked example of the process and modeling hotspots for implementing Web services and Component Based Development:

- **Business Process Modeling**: the identification and definition of the business processes, including their inputs, outputs, and dependencies
- **Business Web Page Design**: the identification and modeling of the Web page designs and their interaction within the Business Web
- **Web Service Identification and Reuse, Supply, Manage, and Consume (SMaC)**: defining the requirements and prospecting for reusable Web services to support the Business Web Pages and the Business Processes defined
- **Web Service Internal Design**: designing and constructing the components and agents that will deliver the component functionality to execute the required Web services across the distributed domain
- **EAI**: Enterprise Application Integration, effectively “hooking” in the requests to both legacy/package data and functionality to deliver the required Business Processes across the software architecture that is currently in place
- **Testing**: providing the capability to dynamically build the test cases and scripts from the design environment and track the test results

**Component View**

Component Based Development (CBD) has gained great popularity in recent years as the technology required to support the development and use of components has matured. Highly capable modeling environments, such as Select Component Factory, support the CBD process from business alignment through to solution deployment by fully implementing the SMaC paradigm.

CBD promises the key benefits of high levels of reuse and complete interoperability between different forms of component implementation as long as they share a common communications standard. Implementations for components include the use of:

- Object technology to implement new business functionality;
- Heritage code wrapping to reuse existing functionality;
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