Chapter 6

Always-On Enterprise Information Systems with Service Oriented Architecture and Load Balancing

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ABSTRACT

In today's world, it is essential for a business to provide a seamless and continuous service to its customers. Such an always-on service is required, not only for the strong competitive environment but also because of the fact that most the customers also have to offer seamless and continuous service to their own customers. In this chain, failure of one of the systems even for a short time can result in a disaster in the entire service chain. A wise approach to provide a continuous service should consider all possible failure areas in a computer-based information system. Since hardware and software are vulnerable to a myriad of problems that can halt the normal operation of a system, an ideal solution should not only consider both of these two components, but also should seek to find ways for them to work in support of each other against a malfunction. This chapter is an attempt to develop a model that provides this functionality. Service oriented architecture (SOA) is implemented in the model due to its tenets that are suitable for such functionality.

INTRODUCTION

Due to the ever-increasing reliance of the society on the Enterprise Information Systems (EIS), these

systems need to be up and running all the time. Malfunction even for a short time can have disastrous consequences in many environments such as banks where almost all of the processes are performed through the IS round-the-clock. This situation is aggravated by the competitive environment where

service consumers have the power of shifting into another service provider in the slightest flaw of satisfaction. The activities and services can be easily imitated by competitors thanks to the ever-increasing standardization of IS that perform these activities and services.

Hence, offering a continuous service is of utmost importance for today's businesses where undisruptive service means lack of failure of IS on which the services depend. However, due to the inherent fragility of IS, there are myriad of factors that have the potential of disrupting the smooth running of these systems. Since IS have mainly two distinct components, namely hardware and software, it is plausible to scrutinize potential failure reasons in these two distinct components where potential failure areas are different from each other. This chapter proposes a model that aims continuous EIS operation in terms of hardware and software components where these components work in tandem. The model uses Service Oriented Architecture (SOA) as an important component of the software side of the model. This chapter is organized as follows: SOA, which is implemented as the main software component of the model is described in

the following section. That section will also cover the Quality of Service (QoS) and Enterprise Service Bus (ESB) concepts of SOA due to their relevancy to the proposed model. Hardware component of the model and the Load Balancer will be described in the following section which will be followed by the section which describes the tandem working of SOA and Load Balancer. A case study that has been developed by the model will be explained next and the chapter will terminate with the conclusion.

SOFTWARE COMPONENT: SERVICE ORIENTED ARCHITECTURE

Although SOA can be defined in several ways, all definitions can be categorized in two main perspectives, namely business perspective and technical perspective. Business perspective can be analyzed in terms of business processes and business services, whereas technical perspective can be analyzed in terms of software components and operational resources. The two perspectives, their components, and their interrelationships are illustrated in the Figure 1.

Figure 1. SOA with Technical and Business Perspective (adapted from OMG)
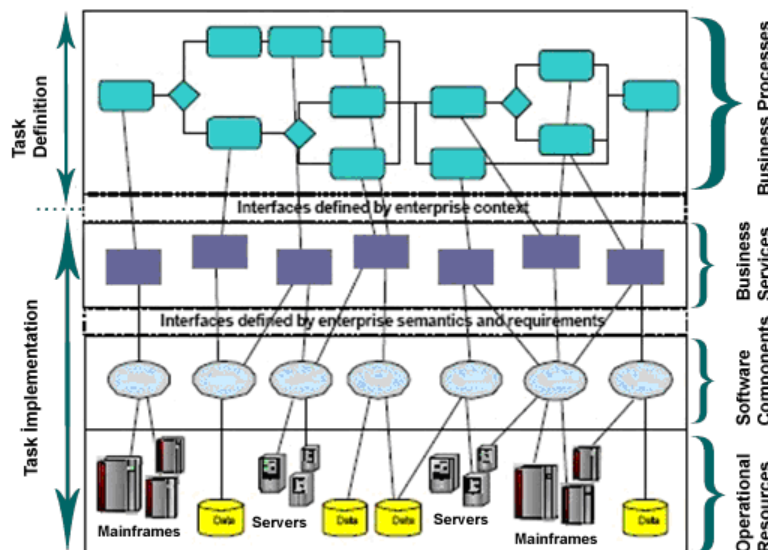
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