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Chapter VIII

Extending Client-Server Infrastructure Using Middleware Components

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ABSTRACT

Embracing inapt infrastructure technology is a major threat in developing extensive and efficient Web-based systems. The architectural strength of all business models demands an effective integration of various technological components. Middleware, the center of all applications, becomes the driver—everything works if middleware does. In the recent times, the client/server environment has experienced sweeping transformation and led to the notion of the "Object Web." Web browser is viewed as a universal client that is capable of shifting flawlessly and effortlessly between various applications on the Internet. This paper attempts to investigate middleware and the facilitating technologies, and point toward the latest developments, taking into account the functional potential of the on-market middleware solutions, as well as their technical strengths and weaknesses. The paper would describe various types of middleware, including database middleware, Remote Procedure Call (RPC), application server middleware, message-oriented middleware (MOM), Object Request Broker (ORB), transaction-processing monitors and Web middleware, etc., with on-market technologies.

INTRODUCTION

Evolution of Internet-based computing from local area networks (LANs), after transitioning from unconnected computers to networks, is the hallmark of all business models today. The technological backbone of this evolution is the middleware. First connecting, then communicating, and, finally, seamlessly integrating the distributed systems to external sites (customers, suppliers, and trading partners across the world) is the real challenge for the business world. It doesn't stop there. Also required is the talking between client and server across heterogeneous networks, systems architectures, databases, and other operating environment. All this is facilitated by the middleware technologies that offer undercover functions to integrate various applications with information seamlessly and instantly make it accessible across diverse architectures, protocols, and networks. Automation of back-end and front-end operations of business is also affected by the middleware. Middleware binds discrete applications, such as Web-based applications and older mainframe-based systems, to allow companies to hook up with the latest systems and developments that drive new applications without making their investments in legacy systems unyielding.

The chances of huge returns expected due to enabling middleware technology are, however, controlled—and often diminished—by the fact that the consequence of unpredictability or improper configuration of the middleware technology is extremely severe. Web browser war has given way to the middleware war. Numerous vendors offer various middleware product families—"the operating system of the Web"—with an estimated growth of about 65% for Object Request Broker, 50% for Messaging and 15% for Transaction Processing Monitor for the year 2002 (Slater, 2002).

FUNCTIONS OF MIDDLEWARE

Middleware functions are generally classified into:

- application-specific functions to deliver services for different classes of applications, such as distributed-database services, distributed-data/object-transaction processing, and specialized services for mobile computing and multimedia;
- information-exchange functions to manage the flow of information across a network for tasks like transferring data, issuing commands, receiving responses, checking status and resolving standoffs; and
- management and support functions to locate resources, communicate with servers, handle security and failures, and monitor performance.

Database, Web and legacy application middleware are three basic middleware application types. Database middleware is the major application in most systems and