Positioning CORBA, J2EE, Web Services and Other Middlewares

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Abstract

Middleware helps to integrate software that has to be written on different systems and in different programming languages -- middleware helps to bridge software boundaries. For many reasons there are now many different forms of middleware. Sometimes there is a natural choice of which to choose, while in other cases the choice comes down to personal or company preferences.

This tutorial positions the most popular forms of middleware, discussing the programming model, flexibilities, strengths and weaknesses of each. CORBA is explained first, in part because it was the first standardized and popular form of high level middleware, and in part because its scope encompasses the programming models of many other forms of middleware. Nevertheless, none of the middleware approaches is held to be preferred, instead each is presented with its own strengths and weaknesses.

CORBA concepts such as IDL, IORs, etc, are briefly explained, as well as flexibility aspects such as the POA, and quality of service aspects such as transactions, security, store and forward, and so on. Some design patterns are presented to guide typical usages. General middleware scalability implications are discussed, including performance, load balancing, fault tolerance, connection management, and so on.

Once this basis is set, other middleware solutions are introduced, including J2EE (including EJB distributed objects); web services (the latest kid on the middleware block); integration services (where message passing, routing, transformations and adapters are the key concepts); B2B middleware (which has to cater for web standards but also established and new standards such as EDI, Rossetenet and ebXML). The sum of the middleware selected will allow integration inside a company's systems, between companies, and across firewalls, that is across the edge of the network.

Case studies form an important part of the tutorial.

Sean Baker is a founder of IONA Technologies. His original experience in distributed computing was gained as a faculty member in the Distributed Systems Group, Department of Computer Science, Trinity College Dublin. Within Trinity, he worked on many projects, designing and implementing support environments for distributed object systems, and also their relationships to databases and persistence in general.

In 1991 he co-founded IONA Technologies to exploit this experience. Sean is IONA’s Chief Technology Officer, and is responsible for IONA’s product vision. He also manages a small group of senior architects that ensure the consistency of our overall...
product range and foster innovation throughout the company. Sean is the author of “CORBA Distributed Objects” published by Addison Wesley Longman and ACM Press. He is co-author of “CORBA Fundamentals and Programming”, published by Wiley.

Before joining IONA in 1995, Declan O’Sullivan worked for Broadcom Eireann Research on projects studying the applicability of advanced information technologies to the telecoms industry within network services (e.g. Intelligent Networks) and within management systems (e.g. TMN). During this time he was an active participant in European research projects such as RACE and Eurescom.

Within IONA, Declan has been responsible for studying and championing the use of middleware products within the telecoms industry, and has also coordinated IONA involvement within several European research ACTS projects.

Declan holds BA (Mod.) and MSc degrees in computer science from Trinity College Dublin.