

## Tutorial: OMG Data Distribution Service

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In many distributed applications, communication patterns follow a data-centric message exchange style of interaction, where applications publish data and other applications express interest in this data by subscribing to it. Applications of this sort can be found in industrial automation, the C4I sector (command, control, communications, computers and intelligence), telecom equipment control, sensor networks, and network management.

Often, these applications are characterized by real-time and predictability constraints, fine-grained application-controlled quality-of-service requirements, and stringent scalability needs. For example, interacting components in the above application examples may scale to hundreds or even thousands of entities.

The data-centric publish/subscribe model has become popular for coordinating interactions in large-scale distributed applications. This model builds on the concept of a global data space that is accessible to all interacting entities. Publishers are applications that contribute information to the global data space and subscribers are applications that desire access to parts of the global data space. Each time a publisher posts new data to the space, the data distribution service propagates this information to all interested subscribers.

The Object Management Group's Data Distribution Service constitutes such a data-

centric publish/subscribe system and aims at addressing the above mentioned requirements. It enables a quality-of-service-driven exchange of data between distributed applications and offers a higher-level data model that allows the expression of aggregation and coherence relationships among data elements.

The objectives of this tutorial are to review the application context of data distribution services, to summarize distinguishing features of existing solutions, to position the data distribution service model in a large context of existing coordination and interaction models, and to outline the architecture and the design of the forthcoming OMG Data Distribution Service specification.

### *About the speaker:*

Hans-Arno Jacobsen holds a faculty position with the Department of Electrical and Computer Engineering and the Department of Computer Science at the University of Toronto. His principal areas of research include middleware systems, distributed systems, and data management. Prior to moving to Toronto, he spent one year as a postdoctoral fellow, supported by a scholarship awarded through the European Community, with the Distributed Database Research Group at INRIA-Rocquencourt in France. He received his doctorate from Humboldt University in Berlin, in 1999.