

Preface



This special issue of the *IBM Systems Journal* focuses on *responsive systems*, a term in which we include real-time and event-based systems. A *real-time system* is a computing system subject to constraints on the interval from the occurrence of an external event until the system response. A real-time constraint can be *hard*, in which case failure to complete the required computation before the deadline amounts to a system failure, or it can be *soft*, in which case delayed responses are tolerated but viewed as lowering the quality of the service provided by the system. An *event-based system* is a computing system whose components operate in response to events. The events processed by a component can be either external to the system or they can be generated by another component.

The rate of deployment of responsive systems is increasing. Information technology systems for business applications are expected to provide better service to customers, in many cases requiring improved response times. The use of embedded systems is proliferating, and in many applications these systems are required to perform under time constraints. The design and implementation of event-based applications are facilitated by improved messaging technologies. Furthermore, the expanded use of service-oriented and component-based techniques is reducing the costs of developing and deploying responsive applications.

This issue of the *Journal* is anchored by the paper “Responsive systems: An introduction,” authored by the issue coordinators, Robert Berry, Paul McKenney, and Francis Parr. Their paper discusses current trends that affect the adoption of responsive

systems and illustrates the use of responsive systems in two areas: the defense and the online gaming industries. The paper also introduces the remaining ten papers of this issue, which are grouped under three headings: platforms, middle-ware, and development support for responsive systems. It also discusses current challenges in this area and ideas for future standardization and development work.

We thank Robert Berry, Paul McKenney, and Francis Parr for making this issue possible. Their contributions were essential in its planning and production.

The next issue of the *IBM Systems Journal* is devoted to service-oriented architecture: from modeling to implementation.

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