Preface

Virtual Machine/Enterprise Systems Architecture™ (VM/ESA™) represents the next major milestone in the history of the VM family of operating systems. It is a single product that supports both centralized and distributed computing systems in a way that preserves data integrity and protects shared resources. Operating systems of this kind are essential to the use of computers today, as more and more computers are linked and are sharing resources and data across more and more networks of heterogeneous computers and systems. Centralized computing, distributed computing, and the resulting concerns about access, sharing, and recovery of data and resources have seen dramatic increases in recent history and are expected to continue unabated. VM/ESA is designed to bring together the three main branches of the VM family in support of these requirements. This special issue has an essay and six papers on various aspects of this subject. We are indebted to E. A. Pruul and L. P. Augostini of the Endicott Programming Laboratory in Endicott, New York, for their valued support of this special issue.

The VM/ESA story begins with an essay by Fischofer on the history of the VM family and the forces that have drawn that family together. He describes how the world of computing has moved from isolated computers and isolated systems of computers to worldwide networks that even today join most computers, systems, and users in a vast and dynamic network. Fischofer describes a near future in which a term like "isolated computer" might come to be regarded as self-contradictory—an oxymoron.

Bringing the VM family together in VM/ESA necessitated an approach to data and a virtual machine architecture that encompassed all three main branches of that family. Gdaniec and Hennessy describe the data approach, VM Data Spaces, and that architecture, Enterprise Systems Architecture/Extended Configuration (ESA/XC). Conversational Monitor System (CMS) users and service virtual machines can take advantage of these features to protect their data resources.

VM/ESA and earlier members of the VM family require a transparent means for supporting applications and operating systems under their control. Enterprise Systems Architecture/390™ (ESA/390™) provides some of that means through the Start Interpretive Execution (SIE) instruction and surrounding operating system code. Osisek, Jackson, and Gum describe the use of SIE and its implications.

Stone, Nettleship, and Curtiss provide a paper on the extensions to CMS that have been built and are now used to support advanced data sharing and DASD space sharing. The resulting Shared File System (SFS) has elements of multi-user and multi-virtual-machine access, security, extension, and resource recovery.

The last three papers in this VM/ESA issue describe different aspects of Coordinated Resource Recovery (CRR), which is a new operating system function. Maslak, Showalter, and Szczygielski show how applications can utilize this function to provide data integrity and recovery for local and distributed shared resources.

Bennett, Bitner, Musa, and Ainsworth continue the discussion of CRR by focusing on its system management aspects. The services provided support recovery logs, help minimize manual intervention, and enhance performance under VM/ESA. This support provides an integrated, consistent, and uniform alternative to application- and resource-dependent resource management.

The Shared File System (SFS) makes use of the support for CRR. Barnes, Coleman, Showalter, and Walker describe that support, including specifics of SFS capabilities and technology. Future directions for SFS are also addressed, including such challenges as sharing of data between a workstation and differently structured hosts or file systems.

With this issue, the *IBM Systems Journal* enters its 30th year of publication. It is the support of readers, authors, and referees that makes such a long history possible, and for that we both thank you and encourage you to continue your participation. It seems appropriate at such a time to state a few facts that sometimes escape us as we focus on a single paper, a theme, or a special issue. First, this publication is a quarterly refereed technical journal, which means that the integrity of each paper is ensured by a process that depends upon reviews of content, currency, and value by recognized experts within and outside IBM. Second, it is intended for the software and systems professional community worldwide. The papers are written for a technically aware readership and are selected from submissions by knowledgeable authors around the globe. Third, the *Journal* has over 100 000 subscribers worldwide. Of those, approximately two-thirds are customers, technical professionals, and researchers; one-third are IBM employees; two-thirds are within the United States; and one-third are outside the U.S. Again, we thank you for your continued support.

The next issue of the *Journal* will be a special issue on advances in cryptography and secure communications through the Common Cryptographic Architecture (CCA) and products based on that architecture.

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Editor