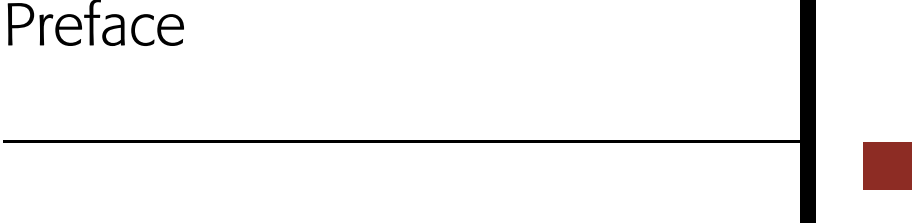


Preface



Open-source software (OSS) refers to software that is released under one of several licenses, the most prevalent of which is GPL (GNU** General Public License) from the Free Software Foundation. According to this license, users have the freedom to run an OSS program for any purpose, have access to its source code, may modify the code, and may redistribute copies of either the original or the modified code without having to pay royalties to previous developers. Referred to by some as a “paradigm shift,” the OSS phenomenon is having a significant impact on the information-technology landscape. Although the revenue generated by open-source software does not come from the products themselves but from related hardware, software, and services, that revenue is now in the billions of dollars and growing.

The 18 papers in this issue of the *IBM Systems Journal* are presented in four groups: the open-source model, development tools and environments, Linux**, and other applications. We thank the issue coordinators, Vivek Sarkar and Sheila Harnett, for their leadership in planning and producing this issue.

The first four papers address some general questions related to *the open-source model*. In their paper “Opening minds: Cultural change with the introduction of open-source collaboration methods,” Neus and Scherf report on the results obtained by applying the open-source collaboration model in a commercial environment. Then, in “The value of open standards and open-source software in government environments,” Simon compares the strengths and weaknesses of the two software-

development methodologies, the OSS model versus the proprietary software model, and evaluates the role of open standards in the adoption of OSS by governmental bodies. Boulanger, in “Open-source versus proprietary software: Is one more secure and reliable than the other?” also compares OSS with proprietary software by analyzing the reliability and security data available for the two types of software products. The last paper in this group, by Capek et al., provides a history of IBM’s open-source involvement and strategy.

The next five papers relate to *development tools and environments*. In “Contributions to the GNU Compiler Collection,” Edelsohn et al. describe a number of enhancements they made to the GNU Compiler Collection, including support for the IBM zSeries* processor. The next two papers deal with the Eclipse platform. The paper by Gruber and Ponzo, “Integrating Web technologies in Eclipse,” describes an approach and an implementation for developing applications in Eclipse that, first, allow the embedding of user interface artifacts based either on widget or markup technologies and, second, provide support for Document Object Model programming. Then, “The Eclipse 3.0 platform: Adopting OSGi** technology” by Gruber et al. describes the evolution of Eclipse 3.0 toward a Rich Client Platform and the challenges encountered by the development teams.

The last two papers in this group deal with aspect-oriented programming, a new software development methodology in which programming entities include both objects and aspects. The paper “Aspect-oriented programming with AspectJ” by Colyer and

Clement introduces the AspectJ language and its accompanying integrated development environment. The paper “Supporting aspect-oriented software development with the Concern Manipulation Environment” by Harrison et al. describes the Concern Manipulation Environment, an open-source Eclipse project that supports the new methodology.

The next five papers deal with *Linux*. In “Using Linux for hardware bring up, development, and manufacturing,” Venton et al. describe an ingenious tool designed to accelerate the bring up of POWER5*-based systems. This tool, known as Bare Metal Linux, is a cut-down version of Linux 2.6 that requires no firmware, has an in-memory root file system, and runs without a virtualization layer. The paper “Providing Linux 2.6 support for the zSeries platform” by Bornträger and Schwedfsky describes the upgrades required for supporting zSeries when migrating from Linux 2.4 to Linux 2.6, including the new device model, the redesigned I/O system, and improved memory management.

In “Virtual Linux servers under z/VM: Security, performance, and administration issues,” Turk and Bausch describe their experience at Colorado State University running hundreds of virtual Linux servers on an IBM S/390* mainframe with the z/VM* operating system. In “A middleware performance characterization of Linux using IBM WebSphere Application Server,” Anand and Jamiison describe the results of a study of the performance of IBM middleware on Linux servers. The last paper in this group, “Building applications for the Linux Standard Base” by Yeoh, describes the work of the Linux Standard Base work group within the Free Standards Group on how to build standards-compliant applications.

The last four papers of the issue cover a number of additional applications of OSS—we list them under *Other applications*. Becking et al. describe MMBase, an open-source content management system, Alpern et al. describe the building of an open-source community within the Jikes* virtual machine project, Yan, Leip, and Gupta discuss the use of OSS in the IBM corporate portal, and Appavoo et al. recount their experience with K42, an open-source operating-system kernel.

The next issue of the Journal is dedicated to *accessibility*, the usability of computer systems by people with disabilities.

Alex Birman, Associate Editor
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