Open source software is the foundation for most development work today. It is common for companies to purchase support services for open source software so that they can focus internal talent on the job of improving the software that runs their business.

Making Open Source Work for You: Achieving Optimum Speed, Security, and Value

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Introduction

Starting from remarkably humble beginnings over three decades ago, open source software (OSS) is the story of a better mousetrap that wins over the world. Originally, the intent of open source projects was to create software that system administrators and developers could use without having to pay licensing fees — but OSS has become much, much more.

Now, 30 years after the first release of arguably the best-known OSS technology, the Linux operating system, there is a rich ecosystem of OSS technologies that provide solutions for just about any layer of software that a given organization might want or need — for virtually any platform or architecture — ranging from IBM Z at the high end to ARM-based edge devices.

Available open source technologies include system software, management tools, databases, transaction processing systems, message handling solutions, artificial intelligence (AI), and machine learning (ML) services. But of particular importance, there are also robust development tools, languages, editors, and integrated development environments (IDEs) as well as artifact management, release management, and associated developer services that are used to construct modern, intuitive applications.

While OSS continues to be available as a community-supported technology, the reality is that most organizations limit their deployment of community-supported technologies to use cases where there is less business risk and where the skills are readily available to keep the associated technologies secure and updated, which was one of the motivations for IBM's 2019 acquisition of Red Hat. For most OSS solutions, the business argument is that working with a trusted commercial support provider is a more efficient and cost-effective way to manage the investment in OSS while lowering risk.

This IDC Technology Spotlight takes a deeper look at the value proposition associated with using commercially supported OSS in mission-critical environments, such as IBM Z.
Benefits

Lower acquisition costs are among the benefits commonly associated with OSS. For many customers, OSS is the means to an end, where the goal is to stay in sync with a fast-moving technology industry and to take advantage of tooling that makes producing modern application software easier and faster. IDC research has found that OSS commercially supported by a vendor frequently offers a lower overall cost of operation — even after considering subscription costs for support — and provides a measurable business value for the organization compared with community-supported alternatives. Commercially supported versions of open source technologies tend to require fewer staff resources for ongoing support, typically are faster to deploy, and offer a more predictable life cycle. Over the long term, use of commercially supported OSS leads to fewer unscheduled downtime incidents, along with a reduction in impact to end users idled by application outages.

Beyond the cost and staffing benefits, the use of OSS is seen as a vehicle that helps organizations stay on the leading edge for technology innovations. The software also has the ability to integrate modern application components, including solutions packaged as microservices, into its most important applications. Figure 1 presents data from an IDC survey of U.S. companies regarding their expectation of potential benefits from the use of OSS.

FIGURE 1: Benefits Anticipated from Use of OSS

What are the benefits your organization gets or expects it will get from using OSS?

- Ability to develop applications by using open source services, code segments, and microservices
- Access to technologies that allow better/faster innovation
- Exposure to emerging/cutting-edge technologies for our developers and operations people
- Reduced software/subscription costs
- Accelerated development, testing, and prototyping

n = 200

Source: IDC's U.S. Open Source Software Use Survey, October 2019

The top benefits that organizations anticipate gaining from the use of OSS are intertwined. Being able to live on the leading or bleeding edge of development trends using OSS allows an organization to innovate more quickly, which in turn leads to more competitive and more successful business operations.
Trends

The Goal to Standardize

Most IT departments have long been on a trajectory to reduce — and, ideally, eliminate — situations where a given solution is available only on a single platform, locking users and applications into that one environment. The intent is to achieve a common set of software products that are available on any and all platforms. This platform-agnostic goal is hardly new. The industry has been looking to successfully abstract the underlying hardware from users, administrators, and developers for as long as multiple platforms have been in use.

One of the great benefits of OSS is the fact that the source code itself is openly available, making it realistic for any interested party with the right skills to take an existing OSS project and port it to a new platform, a new architecture, a new operating system, or a new deployment form factor.

Indeed, in many cases, the open source community has already accomplished this goal, with a number of open source technologies today available to operate a common set of software components on Linux platforms, Unix platforms, and Windows platforms, and even on specialty platforms such as IBM Z. Many OSS technologies have also been ported to mobile devices or to specialty-purpose devices in an Internet of Things (IoT) deployment scenario. Other deeply embedded scenarios include onboard devices that have an ARM-based architecture.

One of the keys to porting OSS to alternate platforms is related to two important OSS packages: the GNU Compiler Collection (GCC), which contains a compiler as well as front ends and libraries for multiple languages, and the GNU C Library (glibc), which provides a set of essential APIs for services that most OSS applications use. GCC can be and has been modified to compile code for platforms that GCC did not originally target. By comparison, glibc contains a collection of expected library files for applications to use after being compiled through the use of GCC.

Modernization Is Made Easier by OSS

Another major reason for embracing OSS is to improve the match between available IT professionals, existing and emerging skills, and developer interests in using exciting new technologies. The availability of modern OSS means that a professional with skills to leverage modern application development environments, DevOps tooling, and orchestration systems can be productive immediately, without being an expert on a given hardware platform. This benefits platforms such as IBM Z, where skills shortages due to retirements can be mitigated by using commercially available open source development tools on the platform.

Modernization on IBM Z

In the past decade, IDC has seen IBM Z (aka the "mainframe") evolve from a siloed platform to what we call a "connected" platform and then to a "transformative" platform. This transition has been driven by IBM, by the IBM Z software vendors and, in no small amount, by businesses themselves. As the focus on customer experience and digitization began to change datacenters into connective hubs via mobile, web, and APIs, the mainframe at first remained siloed and stood apart. For many businesses that relied on the mainframe, this situation was unsustainable. They demanded new solutions — hardware as well as software — that would crack the platform open and enable it to connect to the rest of the datacenter and the outside world. Without such solutions, these businesses would be forced to move off the platform.
Mainframe vendors responded to the market — at first slowly, and then with increasing speed and urgency; now, a vast number of commercial as well as open source solutions and tools are available for IBM Z. The vendors' aim was threefold:

» Maintain all the unique availability, security, and transaction capabilities of the mainframe

» Open up the mainframe to allow businesses to leverage and monetize the trove of data it harbors in unique, new ways with modern applications

» Stem the replatforming tide by making the system as modern as any other

Initiatives such as The Linux Foundation's Open Mainframe Project have produced technologies such as Zowe, which is an integrated and extensible open source framework for z/OS.

IDC believes that mainframe vendors have succeeded in these three goals. IDC research shows that businesses that remain on IBM Z and modernize on the platform achieve higher satisfaction rates for a range of important characteristics than businesses that replatform. This research involved 253 businesses with IBM Z around the world — 144 were modernizers and 109 were replatformers. We found that modernizers reported higher satisfaction ratings than replatformers on all of the following:

» Customer experience

» Overall performance of the platform

» Security, availability, and disaster recovery (DR)

» Agility, microservices, DevOps, and open source capability as well as the ability to use modern languages on the platform

» Ease of finding and keeping talent

» Ability to incorporate AI and/or IoT into the platform

» API, mobile, and web enablement of the platform

IDC also found that modernizers paid less for the modernization initiative than replatformers, even if they were investing the same amount in new hardware. Their software, staffing, third-party consulting, and disruption costs were less than those for replatformers. In addition, IDC found that as a direct result of the modernization initiatives on IBM Z, organizations were able to run more cost efficiently while growing their business. They incurred lower costs in terms of hardware capex (-12.5%), software opex (-5.8%), and staffing opex (-4.6%) while generating more revenue (5.1%).
The modernization initiatives that these businesses undertook include the following (ranked in order of prevalence):

» Bringing AI to the IBM Z (73% of respondents)
» Making the IBM Z part of a hybrid cloud deployment (67%)
» Leveraging the platform for IoT (65%)
» Performing analytics on the platform (62%)
» Enabling the platform for web-based interaction (61%)
» Incorporating the IBM Z in their DevOps and Agile software development culture (60%)
» Enabling the platform for mobile interaction (53%)
» Providing IBM Z as a service as if the platform were a cloud (49%)
» Running microservices on the platform (48%)
» Running Java on the platform (47%)
» Running open source software on the platform (45%)
» Integrating the platform with an API ecosystem (45%)
» Running Linux workloads on the platform (35%)

While open source appears to be lower in the rankings than other initiatives, this is deceptive. First, about 35% of IBM Z businesses have executed initiatives to bring open source to their platform. This is not a small number, and it is growing. Second, there is a tremendous amount of interest in open source among IBM Z businesses, but they introduce it more carefully to IBM Z than to less mission-critical environments. Businesses prefer bringing enterprise-ready open source onto their IBM Z platforms. Third, quite a few of these initiatives involve open source. For example, it is virtually impossible to bring AI to a platform without also introducing a large amount of OSS. In other words, there is a lot of open source hidden in the other initiatives. Moreover, IBM needed to make the platform open source enabled, which the company did. Today, IBM owns Red Hat, and businesses can run OpenShift with their IBM Z. But many organizations wanted the platform to get this foundation before they fully embraced open source.

Businesses prefer bringing enterprise-ready open source onto their IBM Z platforms.
Considering Rocket Software

Rocket Software is a software tools vendor with expertise in developing, porting, and supporting OSS on IBM Z. It specifically supports the deployment of open source solutions including the Bash shell and security technologies such as OpenSSL along with compression and archiving technologies. The company also offers developer-oriented solutions including PHP and Python programming languages, the Vim editor, Git source code control, the Conda delivery and development management, and build tools such as Make and Apache Ant.

What is noteworthy is that the company does not support these tools on IBM’s Linux-on-mainframe solutions including the Integrated Facilities for Linux and the LinuxONE platform. Rather, Rocket Software supports these products operating in a native IBM z/OS environment. Making this support possible is not trivial because the IBM Z uses the Extended Binary Coded Decimal Interchange Code (EBCDIC) encoding versus the more commonly used American Standard Code for Information Interchange (ASCII) system that x86 processors use.

As a result, Rocket Software has developed an automated way to port the popular tools to the IBM Z platform by porting the GCC and glibc technologies to operate natively in an IBM z/OS environment. The company is in the process of moving all the utilities it supports to be ported through these now-native tools on the IBM Z on an automated basis. Being able to port an update using its own tooling means Rocket Software can respond quickly to updates or patches associated with the tools and utilities it supports and rapidly make them available to IBM Z customers.

As part of the process that includes porting and encoding conversions, Rocket Software also curates the OSS products being brought into the System Z’s EBCDIC environment to ensure they are secure, current, and verified as being up to date per the National Institute of Standards and Technology (NIST) National Vulnerability Database. This work ensures that customers working aboard the IBM Z — one of the most mission-critical platforms — are receiving known good software that has been screened for potential flaws. For organizations that require the highest levels of security, Rocket Software’s Conda delivery and deployment management utility can utilize an air-gapped repository that has no direct connection to outside internet as the source for services and tools to be provisioned to developers and administrators.

Rocket Software also offers its software as a nonsupported open source offering on a publicly accessible channel, which requires neither a support contract with Rocket nor any payment. This offering receives updates about once every six months, a schedule that is maintained even if there are discoveries of vulnerabilities or bugs in the underlying code base.

For customers focused on having the most secure and most current utilities, Rocket also offers commercially supported versions of its products that receive low latency patches and updates to their ports as the open source community makes them available. Rocket Software’s commercially supported versions of these utilities, languages, and tools allow customers to outsource the responsibility to stay close to and work with the open source community on product improvements, making it easier to quickly address vulnerabilities or fixes that may become essential for a customer’s environment.
Challenges
The common challenge facing all companies that offer commercially supported versions of OSS projects is articulating the value proposition that a commercially supported version of the product has over and above what a community or self-supported version of the technology offers. While organizations can see the dollar savings of not signing a contract for commercial support, they often fail to recognize the cost savings a subscription can provide, such as eliminating the need to commit staff resources to manage that OSS, track possible security issues, and engage with the community. Nor do they consider the resources expended in vetting and installing fixes when issues are identified.

Conclusion
IDC sees that most enterprises and midmarket companies are interested in OSS, with organizations using such solutions throughout their infrastructure. Equipping the IT staff with tools that are receiving continuous review for security concerns and that have commercial support offers measurable value to an organization, especially in regard to developers, who tend to gravitate toward the latest and most exciting emerging technology. Should a problem be experienced, the business value of commercial support resources becomes evident: Staff can maintain better productivity and the ability to create more reliable solutions with such support. Rocket Software’s mission to bring popular tooling to IBM Z customers addresses a market need that is generally overlooked by the mainstream industry. To the extent that Rocket Software can address the challenges described in this paper, the company has a significant opportunity for success.

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As Group Vice President, Software Development and Open Source, Al Gillen oversees IDC’s software development research portfolio. Research disciplines in this group include developer research covering census, demographics, and developer activities; platform as a service and cloud application services for developers; and developer life-cycle and quality assurance products. In addition, Mr. Gillen jointly oversees IDC’s DevOps research program and runs a program focused on the ecosystem of open source software pan-industry.

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