



2019 Open Source Support Report

Trends, Hot Topics,
and Use Cases in OSS



Introduction

Open source software (OSS) enables innovation and agility across industries and organizations around the world. It is increasingly common, even in the largest and most complex enterprises.

Despite the expanded use of OSS, there are still many misconceptions regarding how enterprises support their open source deployments in production.

This report takes real support data on the top OSS packages to analyze the statistics and realities of open source use, enabling organizations to get the most out of their OSS.

Driving Enterprise Transformation with Open Source

Open source software may have had a rocky beginning, but these days it's hard to imagine that there was ever a world without it. In June of 2001, Steve Ballmer of Microsoft delivered the following quote to the Chicago Sun-Times: "Linux is a cancer that attaches itself in an intellectual property sense to everything it touches."

Fast forward to October of 2018. Microsoft completed its acquisition of GitHub, arguably the most important vehicle for the development of open source software. The story of Microsoft and its relationship with open source software perfectly encapsulates the state of open source in the modern enterprise. What was once seen as a fringe and potentially dangerous emerging segment of the market is now the prevailing methodology for the development of great software.

Rather than develop this software in a closed environment, an innovation echo chamber, open software pulls talented minds from all segments of the industry. Varying minds and cultures converge on a problem and develop a solution collaboratively, transparently, and rapidly.

This methodology isn't going anywhere any time soon and why should it? Many of the vanguard technologies that will transform the human condition over the coming years — such as AI and machine learning, big data and analytics, new paradigms for UI and UX, blockchain, and mission critical software platforms — depend on open source technologies.

TensorFlow and pyBrain are pack leaders for AI and ML. Cassandra, Spark, and MongoDB are emerging as the next generation harbingers of big data. Kubernetes has hit an inflection point and is rapidly changing the way we think about software deployment. As the industry at large grows around these new ways of thinking, these projects will grow right along with it, ultimately supplanting and replacing commercial and/or legacy solutions.

Perhaps the best example of this power shift in 2018 was IBM's acquisition of Red Hat. IBM's \$34 billion bet on this company, who found its humble beginnings as an open source software magazine and catalog business in the early 90s, represents perhaps the single biggest testament to the transformative power of open source in the enterprise.

Despite all of this inertia, I truly believe that this is just the beginning. We've merely hit a saturation point in our fully connected and digitally transformed world. The cultural and technological acceptance and adoption of free software is only the first phase in a series of massive innovative leaps that will touch all of our lives over the coming decade.

Please take some time to read, absorb, and enjoy the content of this valuable report. The approach we're taking to support community software in the enterprise has allowed us unique insight into the dynamics of open source adoption, and we're excited to share our most recent observations and opinions with you and your business.



Justin Reock
Chief Architect
Perforce Software

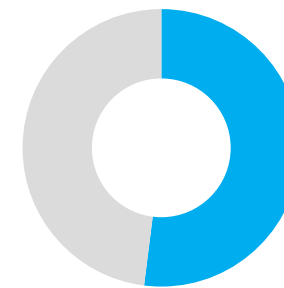
MARKET TRENDS

Enterprise Adoption of Microservices

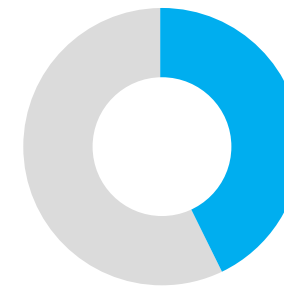
Based on an International Data Corporation (IDC) [Survey Spotlight](#) published in March, 2019, businesses across industries have accelerated their implementation of microservices architectures. More than 52% of survey respondents indicated they have implemented microservices for improved performance and 43% of responding businesses stated they have plans to do so. Responses like these demonstrate that IT leaders are increasingly aware of the improved reliability, speed, and agility that cloud-native applications offer.

[IDC](#) also predicts that by 2022, 90% of all apps will feature microservices architectures. Microservices are being adopted by leading companies in financial services, retail, and other industries to support Continuous Delivery of cloud applications. With microservices, these companies are able to deliver new features into production multiple times a day and support high traffic volumes.

Netflix has been open about its move to microservices to help deliver content to the wide variety of devices that consumers demand. Other adopters — including Airbnb, Disney, GE, and Twitter — have experienced up to 75% reductions in development lead times using microservices.



52%
implemented
microservices for
improved
performance



43%
have plans to
implement
microservices



90%
predicted apps
featuring
microservice
architecture
by 2022

Open Source & GDPR: Processing Personal Data with Privacy by Design

The [European Union's General Data Protection Regulation](#) (GDPR) describes the principles and obligations that must be followed when processing personal data of EU residents regardless of the origin of the processing entity.

GDPR embraces “privacy by design and default.” That is, privacy must be built into technology from the start and not added as an afterthought. Privacy must become integral to organizational priorities, project objectives, design processes, and planning operations. Open source software complements this objective, given its transparent, flexible processes and feedback mechanisms.

Under GDPR, computer security and encryption also gain significance. It includes new requirements for breach notifications, which demand that all affected parties and relevant authorities be rapidly informed. Open source applications may have an advantage here thanks to the ready availability of the source code that can be examined for possible vulnerabilities.

While there are GDPR-compliant open source databases, such as MySQL or MariaDB, most open source database products require the purchase of a commercial license of the open source database to add on GDPR features.



The Google vs. Oracle Legal Battle Continues

It's now been almost nine years since Oracle sued Google for copyright infringement. Oracle originally sued Google in 2010 claiming the Alphabet subsidiary infringed on Oracle's copyrights over its use of 37 Java APIs in the Android OS.

Google argued that its use of the Java APIs owned by Oracle was allowed under the "fair use" provisions of the federal copyright law, and therefore did not infringe on Oracle-owned copyrights. After two jury trials, this issue is back before the U.S. Supreme Court.

In what is sure to be the last chapter in the seemingly unending courtroom drama, Oracle has responded to Google's latest request, filed with the Supreme Court in January 2019, to review the appeals court's ruling. By fall 2019, the U.S. Supreme Court will have a second chance to decide whether to weigh in.



Impact of Oracle Java Subscription Changes

In addition to its ongoing legal battle with Google, Oracle was also in the news in 2018 for announcing that effective January 2019, public [updates](#) for Oracle Java SE 8 will no longer be available for business, commercial, or production use without a commercial license. The announcement outlined a new support model for its commercial Java runtime product and introduces new fees and higher expenses related to support and licensing costs.

As a result, application development and delivery leaders are making decisions on the alternatives, based on the organization-wide impacts on cost, time, resources, and support for maintaining Java applications:

- **Continue to use Oracle Java SE** — the least disruptive but potentially costly option as it requires organizations to secure a commercial support license for Oracle Java SE.
- **Transition to a supported build of OpenJDK** — OpenJDK is functionally identical to Oracle Java SE. However, because it's open source, there are options for support.
- **Embrace the OpenJDK community model** — organizations take over full ownership for ensuring security, availability, and support.

This will be a significant decision for many companies in 2019, especially for those that deploy Java applications on users' desktops.

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Free Software vs. Open Source

It is a common misconception that all open source software is “free.” When Richard Stallman started the Free Software Foundation in 1983, the concept of “open source” software barely existed. Stallman’s vision for free software was philosophically different than our modern-day notions.

The difference is best summed up by Stallman’s ubiquitous quote: “‘Free software’ is a matter of liberty, not price. To understand the concept, you should think of ‘free’ as in ‘free speech,’ not as in ‘free beer.’” In other words, when Stallman envisioned “free” software, he was thinking in terms of software “freedom.” This includes giving people the freedom to study and learn from source code, to contribute and modify it, and — most importantly — to share their contributions with others.

In 1998, 16 years after the establishment of free software, the Open Source Initiative coined the term “open source.” And much to the chagrin of Stallman and his associates, open source rapidly replaced free software as the standard industry term. This is due in part to the almost militant way in which the Free Software Foundation’s preferred license, the GNU Public License (GPL), obligates a user to share modifications and contributions they make to the code with the industry at large. This obligation is referred to as a “copy-left” requirement and stands in fairly stark



Free Software vs. Open Source (cont.)

contrast to more permissive licenses such as the Apache Software Foundation (ASF) license, which do not carry such requirements.

This permissive vs. non-permissive schism in licensing has led to two schools of thought in the modern enterprise. One believes that copyleft restrictions put businesses in a situation where they could be forced to share their intellectual property, including source code modifications, with the public. And for many, this risk is not worth it, especially given the benefits of using GPL software. The other believes that this risk is outweighed by the deep domain knowledge and expertise gained when contributing to a project's community.

Regardless of who is correct, keeping businesses aware of their own license obligation has become a distinct segment of the software market, with companies such as BlackDuck and software projects such as FOSSology providing a way for enterprises to audit their software inventory. As businesses continue to adopt free and/or open source software, it will be interesting to observe the direction in which the industry turns. Will it be toward permissive licenses, or will it be toward copy-left?



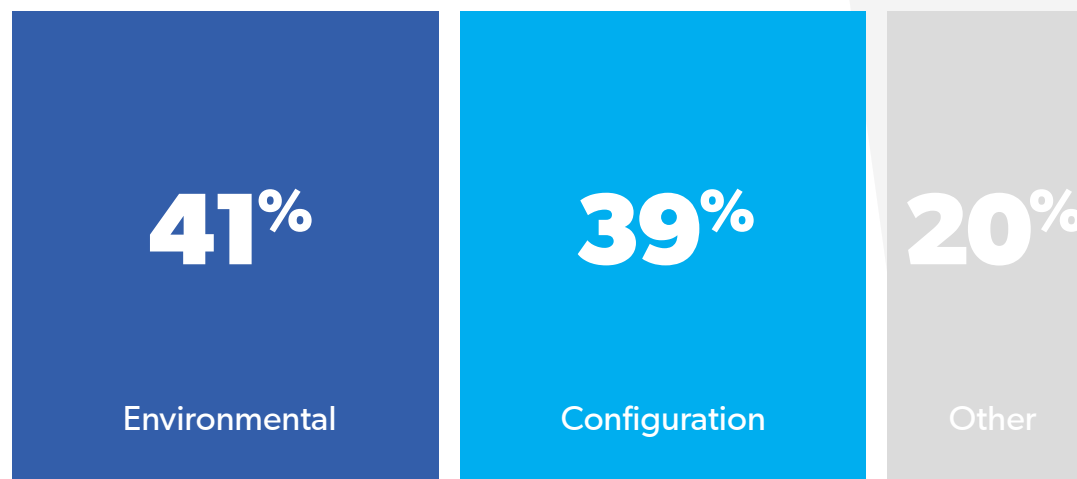
Rethinking Open Source Support

Enterprise technology and operations leaders need to consider their software support strategy as they continue to adopt a wide range of open source packages.

We find that most development teams aren't equipped to support the open source they're using. In fact, 80% of all the issues we see are a lack of open source product knowledge or something in the environment outside of the package, such as an incorrect sizing of disk storage.

Developers may know the specific package they are using, but the problem doesn't usually lie in the package itself.

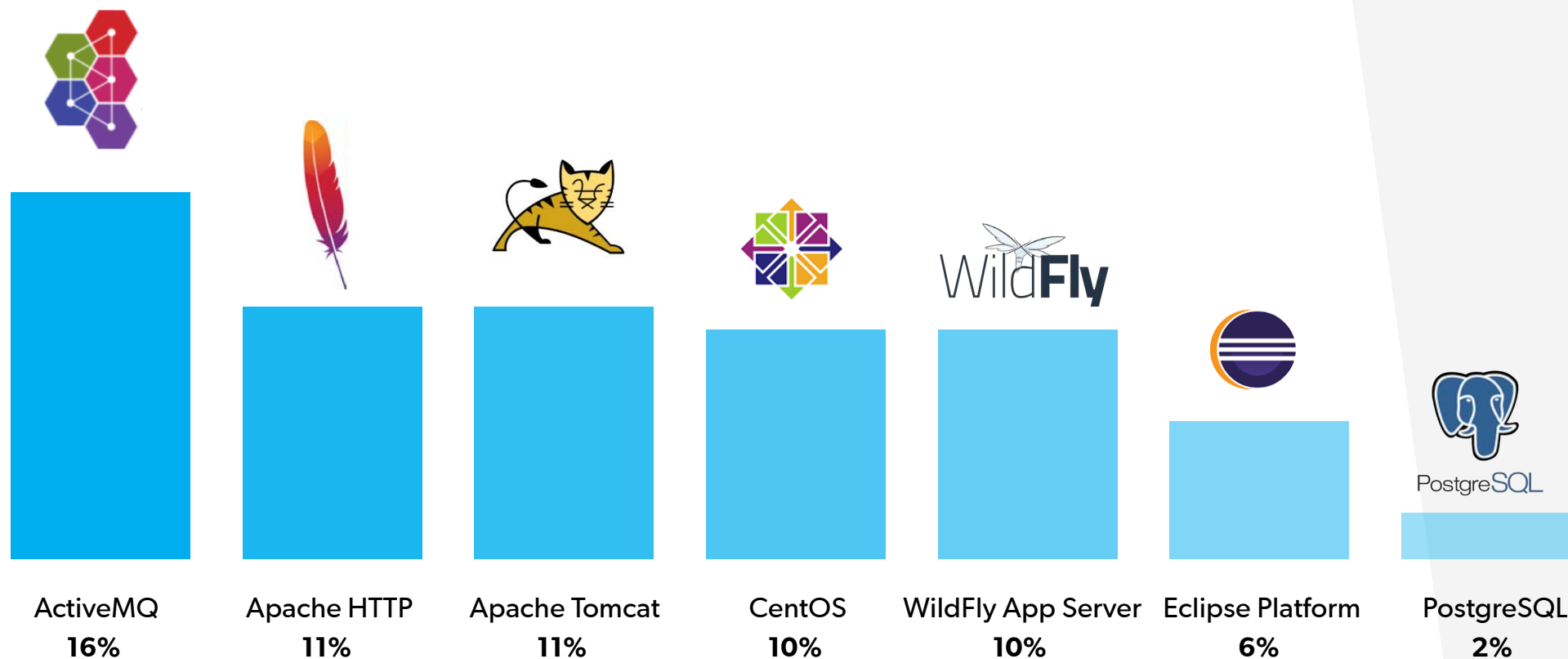
ISSUE CATEGORIES



Source: OpenLogic Support Data, 2018

We find that most development teams aren't equipped to support the open source they're using.

Top Support Requests



Source: OpenLogic Support Data, 2018

We support your entire enterprise stack.

[LEARN MORE](#)

Other Support Package Requests



Other Trends in OSS

We're seeing open source in use across virtually all industries, including construction, transportation, public utilities, and financial services as well as insurance, manufacturing, wholesale, and retail. For example, more of our customers are evaluating and considering:

- Containers
- DevOps
- Big data and databases (such as Spark, Hadoop, Cassandra, MongoDB, and Postgres)
- Monitoring (with Prometheus and Grafana leading the pack)
- Consolidating different technologies from different domains under a single umbrella



RECENT USE CASES

Our Open Source Support Professional Services Team Participates in Many Types of OSS Use Cases

Open source is a growing part of every large enterprise. It's being readily adopted for mission-critical applications. It can, however, be challenging to know what the right combination of open source components is to meet your current and future needs.

Through our OpenLogic professional services team, we interact with many organizations and see many different open source use cases. The following four use cases represent a sample of what we've seen on the ground this year.



Use Case: Training and Supporting Managed Services Providers' Customers on Cassandra

An MSP that provides billing and other services for large telecommunications companies received feedback from one of its customers that the Oracle DBAs weren't knowledgeable enough about Apache Cassandra to support customers' operations.

The MSP engaged OpenLogic professional services team to educate their team on Cassandra and provide Tier 3 and 4 support to their customers.

During the education and training portion of this engagement, our enterprise architect trained several different teams from across the MSP using their own data to run tests and demonstrate ways to incorporate best practices. For example, the MSP had configured Cassandra in a way that sub-optimized data availability.

As a result of seeing the impact directly, using their own data, the enterprise architect was able to build consensus across the teams and change the way the MSP was configuring and managing their clients' data.



Use Case: Properly Configuring Kafka to Log Cryptocurrency Transactions

One of our OpenLogic open source support customers was having trouble with Kafka. They were using Kafka as a ledger system for cryptocurrencies. They were getting an error message in the logs. The error message said that there were out of sequence messages so the system stopped processing new messages.

During our investigation, we discovered that they had been storing the Kafka logs in a Docker container in a TEMP directory. When they were performing a system upgrade, the container with the Kafka logs was lost, so new messages were unable to reference the previous Kafka logs.

As a result, the client needed to rebuild the dataset and now knew that to prevent this problem from reoccurring, they needed to move the logs into persistent storage. They first tried to do this by using a shared disk in an NFS system. However, we advised them that this was not the best approach for a production environment, so they moved to network-attached storage. Now they have a more persistent ledger system in place and the error has not recurred.



Use Case: Supporting MongoDB to Log Communications Company Transactions

A customer in the communications industry implemented a SaaS API management solution to capture incoming network traffic and log it into a database for analysis. The API management system was configured to log this data to either a traditional RDBMS or a NoSQL database.

The customer chose the NoSQL database, MongoDB, but they did not have existing expertise with the database on their team. The customer engaged the OpenLogic professional services team to support and assist them with standing up a shared cluster with MongoDB.

With the aid of our enterprise architect, the customer was able to complete the project in less than half the time expected. In addition, we provided training and documentation to transition the management of the database to the customer. We advised the customer of pitfalls to be aware of and how to address those issues, which included sizing, performance, and security concerns.



Use Case: Oracle to OpenJDK Migration for Large European Financial Services Company

When Oracle announced that public updates including maintenance and support would no longer be available without a commercial license, the bank conducted an analysis and determined it would be too expensive to purchase all of the commercial licenses it would need. Instead, they decided to migrate to OpenJDK.

Given their strict security requirements, they needed guidance on building their OpenJDK to import security fixes sooner than they would otherwise be released by the open source community.

They engaged us to help them build OpenJDK from scratch to meet their security requirements. Together we automated the process of pushing out installs and updates to thousands of workstations.



Our Open Source Experts Are Top-Tier

"Vince was available to troubleshoot this issue and help us find the root cause. He also provided us with recommendations, joined the important calls with management, and stayed on calls to troubleshoot this issue. His expertise helped us find the root cause and fix the issue quickly."

"The interaction was helpful, Andrew was a really good guy to work with and solved the problem on his first try. Turnaround time was very prompt. I'm really happy with the results."

"The customer resolved a problem involving multiple components within a sophisticated setup with just one call to OpenLogic."



LOOKING AHEAD

Momentous Year for Open Source Software

It's been a year of maturity for open source companies, following a peak in both adoption and generation of open source initiatives worldwide. The M&As and IPOs, led by the likes of RedHat, Elastic or GitHub are, according to Forbes, north of \$57B in value. Beyond the financial implications and the break into Wall Street, we are now seeing open source software (OSS) as the unquestionable main character in the current generation of IT. Present tense.

There's virtually no AI or ML without open source and all blockchain is built on open source components. Most corporate developers are using Kubernetes for container orchestration. And most are building code faster by implementing CI/CD methodologies on industry-leading, open source components like Jenkins, Maven, and SonarQube.

Applications are monitored with open source software that allows the flexibility and scalability to match the speed of development. All real time data processing and data science are built on open source technologies like Apache Spark and Apache Hadoop. Open banking applications are using open source by default. Edge computing can only run on open source infrastructure software, where all the 5G capacities are being developed. And IoT continues to evolve thanks to the ability of Linux to run in the smallest processing real estate.

So, while you continue to realize your continuous transformation projects, you will undoubtedly find open source software as a primary option. Consider reaching out to OpenLogic to help you navigate this fast-paced world securely.



Tim Russell
Chief Product Officer
Perforce Software

Got Questions?

We've got answers and we're here to help.

[TALK TO AN OPEN SOURCE EXPERT](#)

Solve your open source challenges with full-stack enterprise support.

[GET A CUSTOMIZED SUPPORT QUOTE](#)

Resources

Impact of Oracle Subscription Changes

- [See What Java Experts Had to Say](#) about the Java SE commercial license.
- Considering OpenJDK? [Read this February 2019 Forrester Report](#).

Other Trends in OSS

- [Monolith to Kubernetes While Keeping Your Humanity](#)
- [Monitoring Java Applications with Prometheus and Grafana](#)
- [Big Data On Demand with MongoDB](#)
- [Cost and Choice: Breaking Down Open Source Barriers](#)