



TREND REPORT

OCTOBER 2023

Kubernetes in the Enterprise

Redefining the Container Ecosystem

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Welcome Letter

By Ray Elenteny, Solution Architect at SOLTECH, Inc.

The adoption of Kubernetes continues its march forward. Is it a perfect technology stack? No, but what technology stack is? Does it have a somewhat steep learning curve? Yes, it does. With these and other questions, you might ask:

"Why does the adoption of Kubernetes continue to grow, and do I *want* to jump into the pool? Isn't it just (and yet) another deployment abstraction layer like how virtual machines eventually became ubiquitous?"

To some extent, those are legitimate questions.

As someone who has literally spent decades in this industry delivering products and applications, the drive to deliver applications more efficiently and quickly has, at the very least, remained a constant, and one could argue that the drive to deliver continues to increase in intensity. I see Kubernetes as an opportunity to take a significant step forward in improving application delivery.

Many of us love researching and adopting new technologies. Kubernetes and containerization, in general, are "cool stuff." However, many of us also make a living in this field, and businesses don't really care about cool stuff. Stakeholders want to be shown how they can leverage technology to their advantage.

When you look at the topics presented in this Trend Report, they focus on technical opportunities, managing costs, and streamlining processes — important topics to business stakeholders.

While Kubernetes is an evolution in technology, when applied with the right mindset, it encourages a cultural shift. To me, this is what makes Kubernetes exciting. I see it analogous to the Agile movement. Key to Agile methodologies is having representation from all aspects of an organization. Kubernetes, done well, is a collaborative effort across multiple organizational disciplines.

Kubernetes has allowed the replication of production-like environments to be available as early in the process as an engineer's workstation. This capability facilitates more communication between those creating an application and those who deploy and monitor it; all parties involved get to understand each other's requirements and challenges, and working as a team can resolve them. This requires cooperation, teamwork, empathy, and a host of other "soft skills." It can change the culture of an organization, and I would argue for the better.

So while you explore in the 2023 *Kubernetes in the Enterprise* Trend Report how Kubernetes can move your business forward, consider how Kubernetes can also impact the culture within your organization — for the better. 🏠

Seize the Opportunity,



Ray Elenteny



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With over 35 years of experience in the IT industry, Ray thoroughly enjoys sharing his experience by helping organizations deliver high-quality applications that drive business value. Ray has a passion for software engineering. Over the past ten years or so, Ray has taken a keen interest in the cultural and technical dynamics of efficiently delivering applications.



Key Research Findings

An Analysis of Results from DZone's 2023 Kubernetes Survey

By G. Ryan Spain, Freelance Software Engineer, former Engineer & Editor at DZone

Kubernetes: it is *everywhere*. To fully capture or articulate the prevalence and far-reaching impacts of this monumental platform is no small task — from its initial aims to manage and orchestrate containers to the more nuanced techniques to scale deployments, leverage data and AI/ML capabilities, and manage observability and performance — it's no wonder we, DZone, research and cover the Kubernetes ecosystem at great lengths each year.

In September 2023, DZone surveyed software developers, architects, and other IT professionals in order to understand the state of Kubernetes across enterprises.

Major research targets were:

1. The current state of containers and container orchestration
2. Kubernetes advantages, disadvantages, and pain points
3. Kubernetes practices and techniques

Methods: We created a survey and distributed it to a global audience of software professionals. Question formats included multiple choice, free response, and ranking. Survey links were distributed via email to an opt-in subscriber list, popups on DZone.com, the DZone Core Slack workspace, and various DZone social media channels. The survey was opened on August 31st and ended on September 19th; it recorded 103 complete and partial responses.

Demographics: Due to the limited response rate for our 2023 Kubernetes survey, we've noted certain key audience details below in order to establish a more solid impression of the sample from which results have been derived:

- Respondents described their primary role in their organization as "Technical Architect" (22%), "Developer/Engineer" (21%), "Developer Team Lead" (13%), "Consultant/Solutions Architect" (11%), and "DevOps Lead" (11%).
- 80% of respondents said they are currently developing "Web applications/Services (SaaS)," 55% said "Enterprise business applications," 22% said "Native mobile apps," and 21% said "High-risk software (bugs and failures can mean significant financial loss or loss of life)."
- "Java" (74%) was the most popular language ecosystem used at respondents' companies, followed by "JavaScript (client-side)" (56%), "Python" (52%), and "Node.js (server-side JavaScript)" (43%).
- Regarding responses on the primary language respondents use at work, the most popular by far was "Java" (43%), followed distantly by "Python" (15%) and "Go" (11%).
- On average, respondents said they have 17.28 years' experience as an IT professional, with a median of 18 years' experience.
- 33% of respondents work at organizations with < 100 employees, 18% work at organizations with 100-999 employees, and 47% work at organizations with 1,000+ employees.

In this report, we review some of our key research findings. Many secondary findings of interest are not included here.

Research Target One: The Current State of Containers and Container Orchestration

Motivations:

1. Kubernetes and containers are inextricably linked, and one of the main reasons behind container orchestration demand — and, by extension, the purpose of this very report — is the use of containers *seemingly everywhere* in contemporary software development. We wanted to know how often containers are being used today compared to our surveys from previous years, and whether organization/application size correlated with container usage.
2. Container usage can be so prevalent in modern software because of the availability and accessibility of robust container management tools. From free and open-source tools to paid, enterprise-level solutions, there are more than a few options for spinning up, managing, and orchestrating containers. We aimed to see which container tools were being used most often.

3. Finally, to get to the crux of this Trend Report, we wanted to find out how often Kubernetes is being used — both organizationally (how many companies are running Kubernetes clusters) and individually (how many software professionals have worked with Kubernetes themselves).

CONTAINER POPULARITY

In 2021's *Kubernetes in the Enterprise* "Key Research Findings," we speculated that containerization may have reached a point of saturation based on the results of our survey. Last year, our data indicated that container usage may have even begun declining, especially among smaller organizations.

To continue this analysis of the prevalence of containers, comparing with annual data from 2017 to the present, we asked:

Do you use application containers in either development or production environments?

Results (n=91):

Figure 1

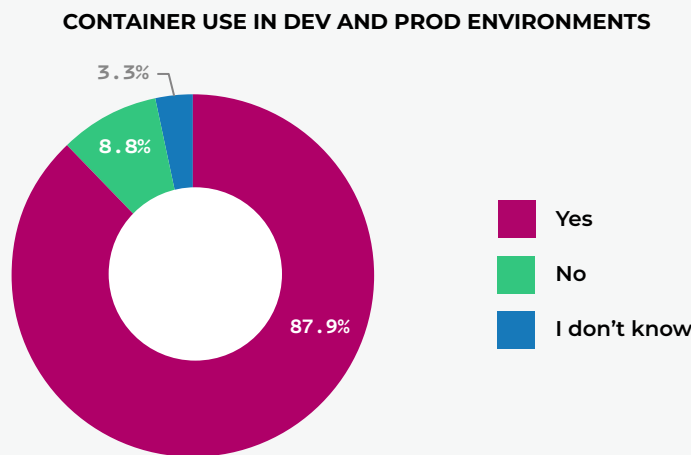
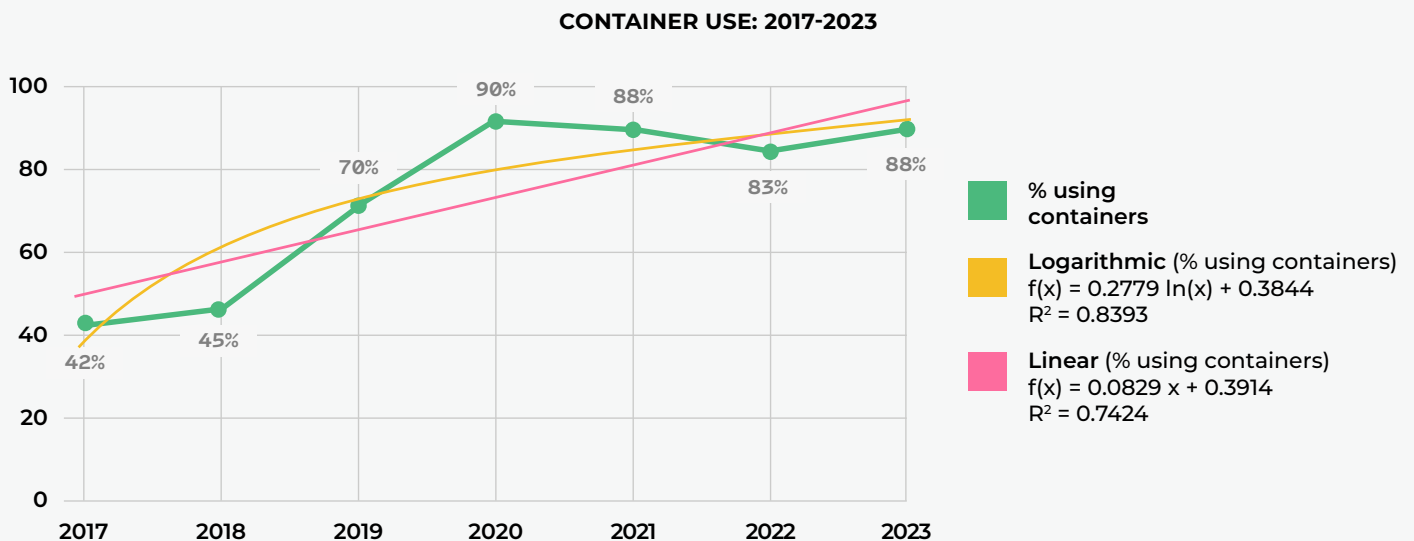


Figure 2





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