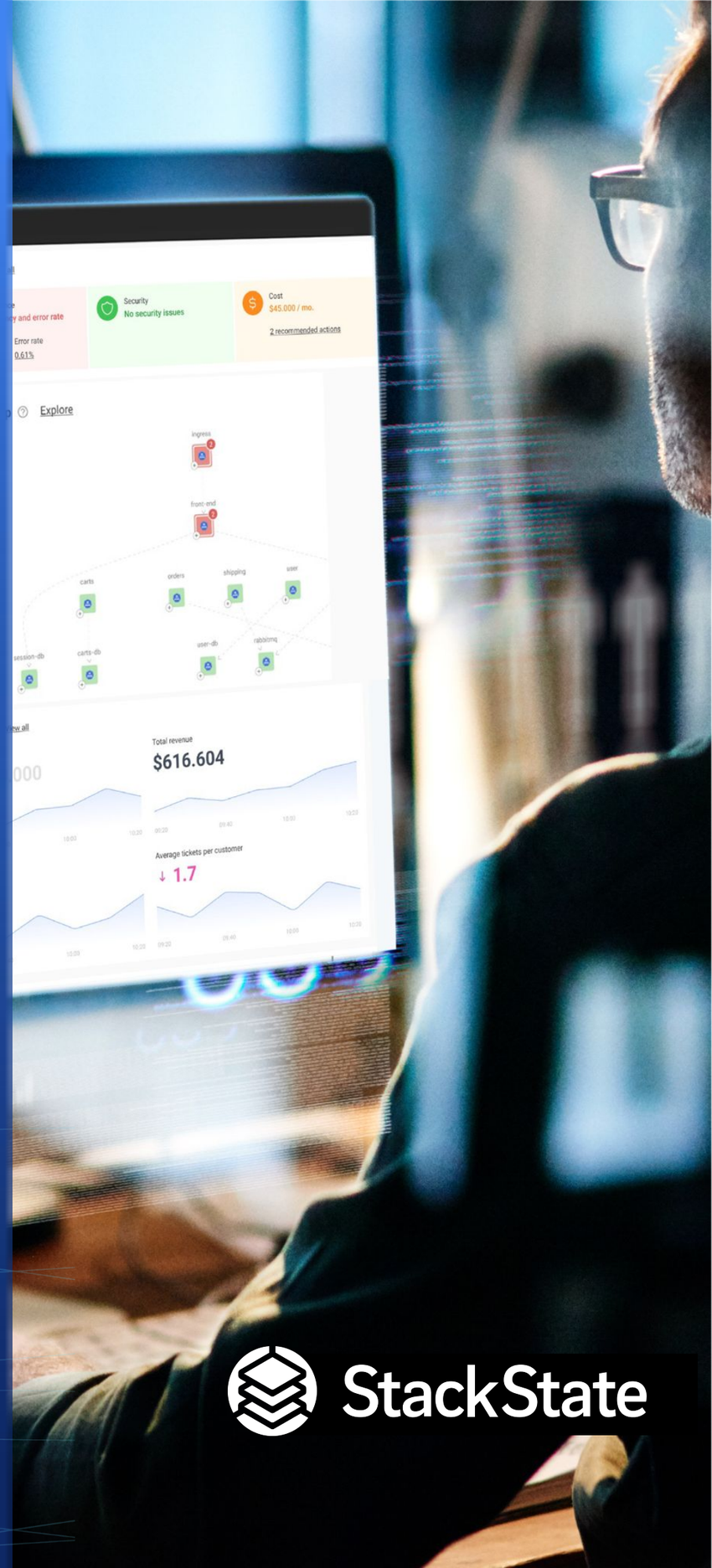
OVERCOMING

5 Kubernetes Obstacles with StackState

A Platform Engineering Guide To Drive Developer Adoption



Understanding Kubernetes

1. *Statista, Kubernetes - Statistics & Facts*
2. *Gartner, 3 Steps to Kickstart Platform Engineering in Your Organization Published 10 November 2022, By Analyst(s): Bill Blosen, Manjunath Bhat, George Spafford*

Platform engineering is a hot topic these days

— a methodology that aims to reduce complexity and accelerate the software development life cycle by creating a stable and scalable platform that developers can build upon.

If you drive platform engineering operations and you've already adopted Kubernetes for your container orchestration, you're in good company. Over 60% of organizations choose Kubernetes to facilitate both declarative configuration and automation.[1]

While Kubernetes has gained immense popularity, developers and engineers often encounter challenges due to its complexity, especially when troubleshooting the Kubernetes ecosystem's intricacies.

How do you excel in crafting the perfect platform and gaining developer buy-in? One approach recommended by Gartner is to infuse your platform with appealing capabilities that developers want to embrace, thereby enhancing adoption and impact.[2] This is precisely where StackState comes into play.

Let's explore how to do just that.

Empowering Developers to Troubleshoot K8s-related Incidents With Confidence

StackState was designed to offer engineers the oversight required for efficiently managing Kubernetes reliability across the entire organization. However, we knew that if developers became entangled in troubleshooting Kubernetes applications instead of focusing on innovation, it would lead to widespread frustration and make platform adoption even more challenging.

To ensure mass adoption of your platform, you need to eliminate the bottle-necks and blind spots your developers face when attempting to resolve issues. This enables them to swiftly address problems, redirect their attention towards strategic priorities and engage in the innovative tasks they were hired to tackle.

With that in mind, let's look at today's Kubernetes platform challenges and explore how StackState's full stack observability and troubleshooting solution can alleviate developer headaches while providing the entire program engineering team a smoother path forward.

> Product teams often use a disjointed collection of tools and struggle to navigate increasingly complex architectural choices and security requirements.
>
> Software engineering leaders must kickstart platform engineering to improve the developer experience and accelerate value delivery.

Gartner

3 Steps to Kickstart Platform Engineering in Your Organization 10 Nov 2022 by Bill Blosen, Manjunath Bhat, George Spafford

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1 Too Many Tools

What's the problem?

In the current Kubernetes ecosystem, an expanding array of developer tools used for instrumentation and monitoring results in unnecessarily intricate navigation. This constant need to switch back and forth between tools to retrieve information and accurately pinpoint issue resolution leads to growing developer frustration. In short, development teams are fed up.

This burden is amplified when a developer is combating a service interruption that's directly impacting customers. Navigating from command-line tools to dashboards and log analysis tools — and vice versa — can be a challenge.

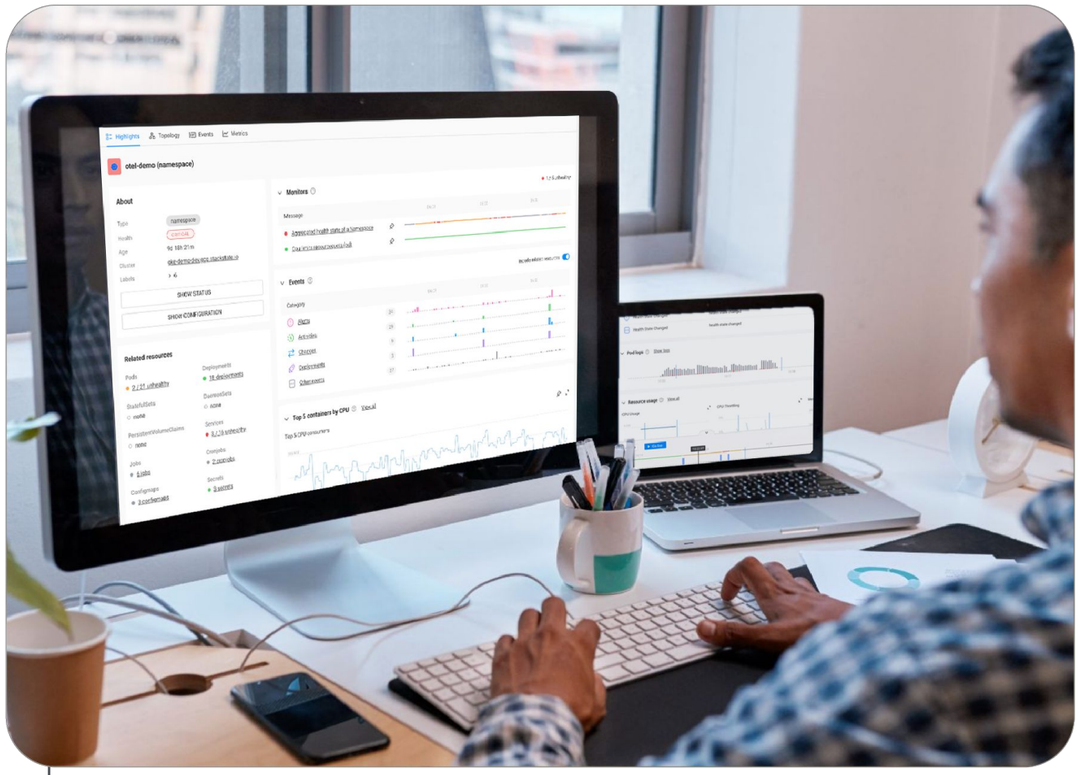
You first have to know how an application connects to other services, and you must constantly zoom in and out of time to rule out possible causes before you can determine the definitive root cause. Spending valuable time stuck in the weeds like this directly impacts innovation, software quality, and, candidly, the overall job satisfaction of the developer doing the debugging.

What can you do about it?

With StackState, you and your team can conveniently access all crucial troubleshooting information from a single screen. We call this "giving them one tool to rule them all" — a simple strategy that empowers users to focus on the issues that require immediate attention without unneeded distractions.

This approach is achieved by automatically collecting and correlating all of your data from all of your resources so developers who are busy troubleshooting issues can conveniently access all essential information in a unified location, sparing the need to navigate multiple tools.

In addition, we present everything within the context of their corresponding resources through our dynamic dashboards, offering comprehensive overview and detail pages for the most critical resource types. And with our intuitive browsing feature and real-time visualization, navigating the entire Kubernetes environment is significantly easier.



Instant visibility into everything K8s with a single, unified interface

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2 The Data Deluge

What's the problem?

Adding to the innate complexity of troubleshooting across multiple tools is the monumental volume of metric, log, event, and trace data generated by a Kubernetes cluster. Notably, Kubernetes lacks a built-in way to collect and aggregate detailed metrics or traces from containers or nodes in a cluster.

This severely hampers developers when trying to locate the details required for problem diagnosis. Further complicating the process, Kubernetes doesn't have sophisticated built-in tools to gather, consolidate, store, visualize, and analyze data effectively.

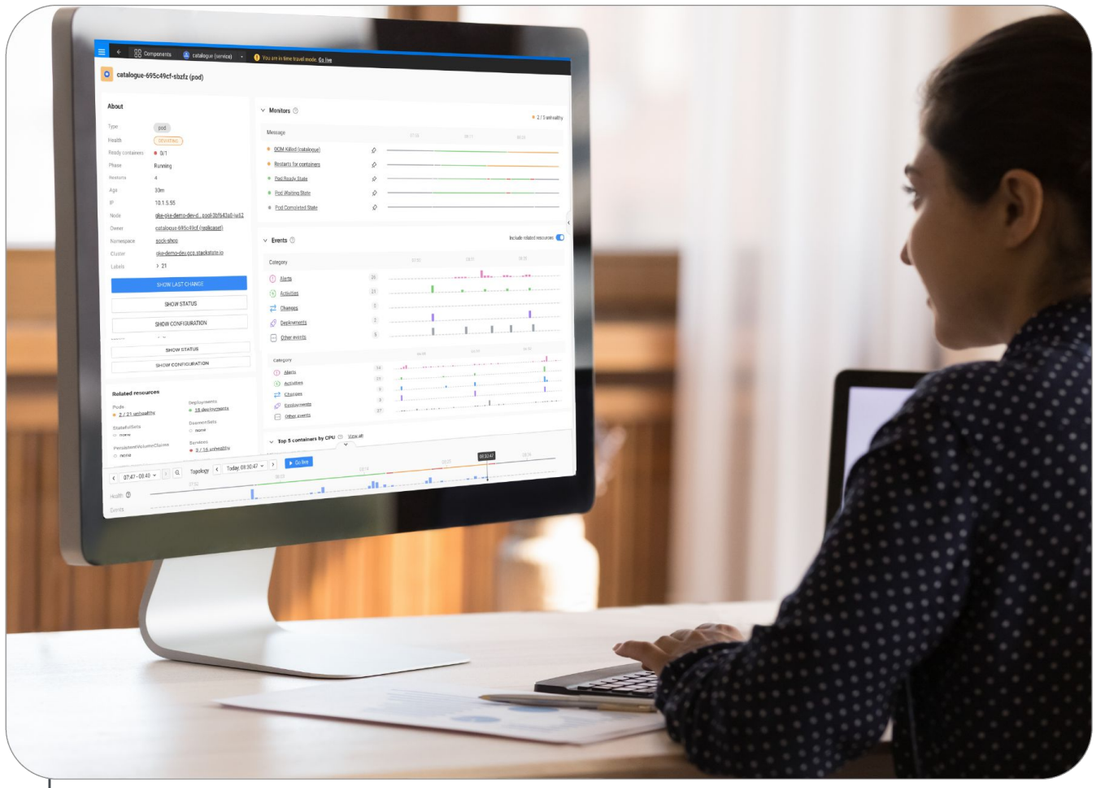
Without a clear understanding of relationships between entities and other interdependencies, you'll never fully know your Kubernetes environment. Even the most skilled developers and engineers might find it tough to figure out where to concentrate their efforts.

What can you do about it?

All information from Kubernetes events, status updates, configurations, container logs, and component metrics are organized and correlated into one intuitive view that prioritizes the data that matters most and displays the most critical information first. This approach makes it easier to understand the interrelationships between different components.

In addition, we leverage our proprietary dynamic topology to track and retain the state of K8s clusters at any moment in time — including all configs and associated resources. By combining real-time data with historical information, developers can quickly identify and resolve potential issues before they become even more significant problems.

But StackState isn't just about centralizing data; we offer the ability to mark crucial moments across various components and data types — the real key to taking Kubernetes troubleshooting to the next level.



Know what is happening at any moment in time for quick resolution

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3 Alert Overdose

What's the problem?

Alert fatigue is a common issue among developers, often resulting in overlooked alerts, delayed incident response times, and employee burnout. Regardless of the tech team managing your Kubernetes applications, they are likely grappling with an endless and overwhelming stream of alerts. This can quickly render them oblivious to what's really important in their dynamic K8 environments.

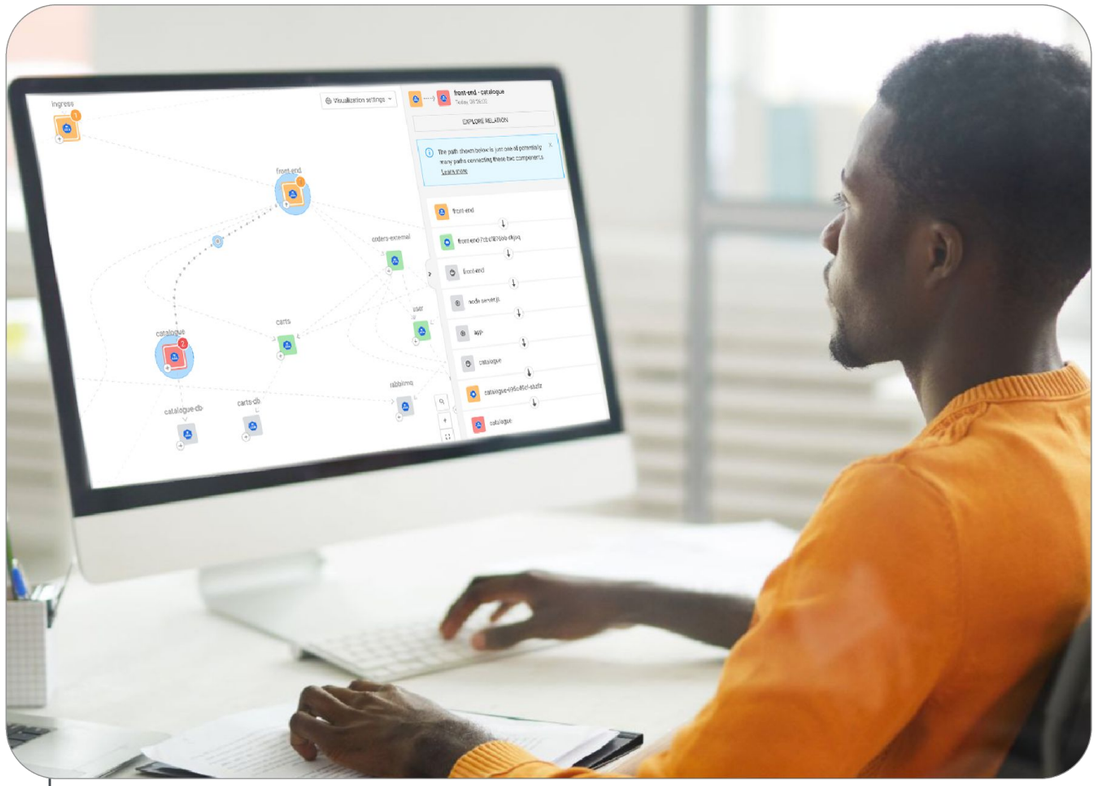
To make matters worse, this barrage of alert noise can easily redirect your developers' focus. They might chase a lesser alert on the wrong pod or cluster, while a more critical issue negatively impacts the customer experience. Without sound guidance or true visibility, it's nearly impossible to quickly and effectively identify and remediate a problem or understand how the issue occurred in the first place.

What can you do about it?

StackState empowers developers with the capability to skillfully troubleshoot Kubernetes-related incidents through real-time dependency maps. These out-of-the-box tools automatically identify and exhibit the interdependencies among all components at any moment in history.

This is accomplished by combining all service and infrastructure maps within your environment and enhancing them with an up-to-the-minute Kubernetes topology encompassing all pods, containers and processes. Through StackState's real-time dependency maps, your developers can readily recognize services and resources and get a holistic view of the entire K8 cluster.

As your developers gain the ability to perceive intricate relationships, monitor resource modifications, and oversee service performance — even those they don't directly manage — they can cut through the noise for even faster issue identification and resolution.



Understand impacts and dependencies with a real-time visual map

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4 The Widening IT Skills Gap

What's the problem?

It's a fact: 95% of technology managers face challenges finding skilled talent for their workloads.[1] So it should come as no surprise that as the adoption of Kubernetes accelerates, many companies grapple with a shortage of requisite skills within the development teams hired to address K8 incidents. Truth is they were hired to innovate not troubleshoot, and Kubernetes can be challenging for even for the most proficient IT professional.

This gap translates to sluggish response times and keep developers from fully harnessing the potential of Kubernetes. However, addressing and resolving issues must take precedence in order to prevent customer disruption and maintain service reliability. When developers are forced to prioritize manual instrumentation and routine tasks over new feature development, they are bound to get more and more frustrated with your platform.

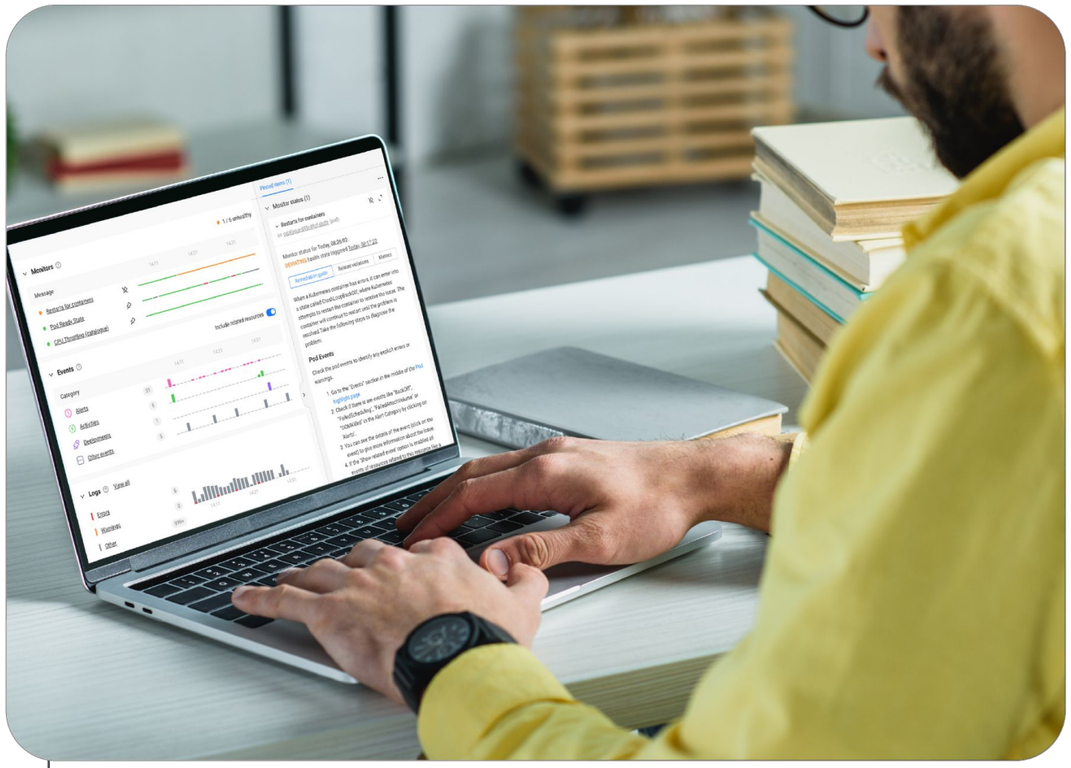
1. *The Skills Gap in Tech Is Poised to Expand. Employers, What's Your Action Plan? February 2024, by Robert Half*

What can you do about it?

The most straightforward approach involves solving problems within minutes rather than hours. We recognize that not every Kubernetes issue is obvious enough to identify and resolve immediately. That's why we introduced remediation guides: systematic, step-by-step playbooks designed to assist every team member, irrespective of their skill level, in uncovering the underlying cause of an issue and helping them remediate it quickly.

StackState includes a range of pre-configured Kubernetes troubleshooting best practices to help you spot issues in less time. These built-in tools offer intelligent problem clustering, hints and suggestions, and visual assistance to resolve issues quickly.

What's even better, platform engineers can expand these guides, sharing their expertise with other developers and engineers engaged in Kubernetes deployment.



Eliminate the guesswork with step-by-step guidance

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5 Siloed Teams

What's the problem?

Regrettably, your platform's requirements extend beyond just linking tools and data; they also need to bridge disconnected teams. Lacking organization-wide monitoring methods creates barriers to information exchange and stifles collaboration.

When each team receives alerts in an isolated vacuum, it's all too easy to attribute issues to another group — and that does nothing more than leave the customer on the losing end of your Kubernetes-based applications.

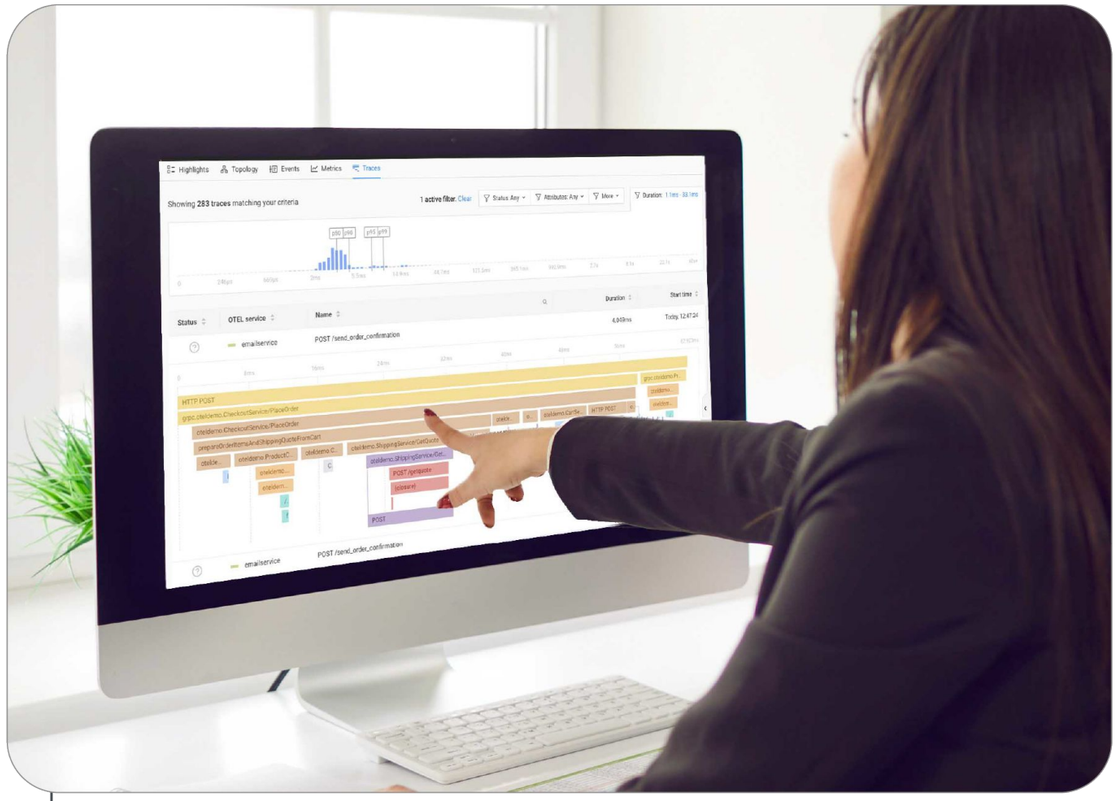
When deploying your applications on Kubernetes, appropriate tool selection is key. They should empower your engineering, operations, and application teams to cut through the noise and focus on what truly matters. By furnishing your team with collective real-time insights, automated best practices and prompt problem-solving, you'll foster more efficient cross-team collaboration and potentially see better business outcomes.

What can you do about it?

Make sure that everyone is literally on the same page — or screen. StackState's award-winning full-stack observability and troubleshooting solution effectively connects the dots and bridges the gaps within your Kubernetes environment — and your full stack — across your engineering and developer teams.

Our always-on automation tool provides the necessary context for teams to stay abreast of their ever-evolving technology stacks. We integrate Kubernetes expert practices into pre-configured monitors which mitigates the risk of undetected problems and helps maintain a healthy and robust Kubernetes environment, all while at the same time fueling a higher level of team collaboration.

StackState also seamlessly integrates its alerts with popular communication tools such as Slack, Microsoft Teams, PagerDuty and OpsGenie, so your team stays updated on critical issues in the channels you already use daily. By streamlining alerts and notifications, StackState facilitates more efficient collaboration, improving your team's ability to remediate incidents faster.



Give everyone a single intuitive view of your entire K8s environment

Reducing K8s Complexity for Developers — and Engineers, Too

If you can only take away one idea from this ebook, let it be this:

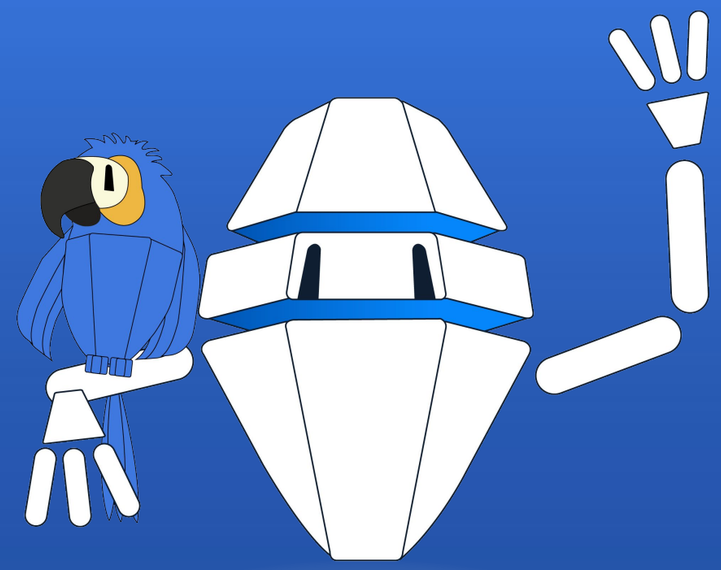
StackState provides exceptional insight into all things Kubernetes and is built to speed up troubleshooting while avoiding DevOps roadblocks.

Tailored for engineers, with developers in mind, our full-stack observability and troubleshooting solution offers:

- Unified interface eliminating the need to bounce from multiple tools
- Actionable view of every resource from clusters to containers
- Kubernetes errors translated into developer-friendly terms
- Expert guidance out-of-the-box for ease of remediation
- Detailed tracking and data analysis to proactively pinpoint issues
- Change intelligence, past & present, to identify true root cause
- Capability to identify 80% of issues (or more) without writing code
- Easy eBPF install plus OTel capability to see your full stack in minutes

Shift Kubernetes troubleshooting from issue resolution to application improvement with StackState.

Curious if StackState is the perfect fit for your troubleshooting and observability needs?



Dive in by taking a StackState self-guided tour!
www.stackstate.com/explore

Or jump right into a StackState free trial with your own data. It only takes around five minutes to set up!
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Power your teams with better observability

StackState, with its advanced observability features, empowers engineers and developers to gain deep insights into their applications. Our platform helps IT teams fix problems fast and stop them from reoccurring so they can optimize performance, seamlessly collaborate across teams and deliver more innovation. Leading enterprises like KPN, Vodafone, Accenture and Danske Bank rely on StackState for the visibility and guidance they need to ensure visibility and reliability across their entire IT stack.

For more information, visit **www.stackstate.com** or see observability in action at **www.stackstate.com/explore**
Or follow us on: