NGINX
Part of F5

PRESIDIO®

OVERCOME COMPLEXITY AND COMMON CHALLENGES IN KUBERNETES

Discover the solutions and strategies you need to simplify and secure your modern applications and containerized environments.

The future's bright for Kubernetes and the organizations that use it

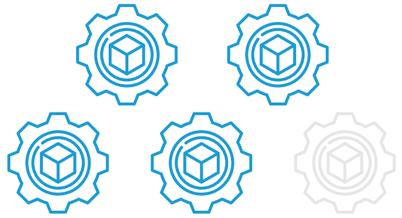
Where are you on your Kubernetes journey?
Thinking about it, getting there slowly, or well advanced?

Wherever you are at, you're not alone in your choice of platform.

According to the 2020 Cloud Native Computing Foundation Survey...

92% of companies say they use containers in production, an extraordinary 300% increase from just 23% in March 2016.

91% of respondents say they're using Kubernetes



83% of the respondents using Kubernetes are deploying in production

It's a wise decision, too. When properly implemented and with the right tools applied, Kubernetes is a true enabler of digital transformation.

With Kubernetes, you can:

Mouse over each item to learn more

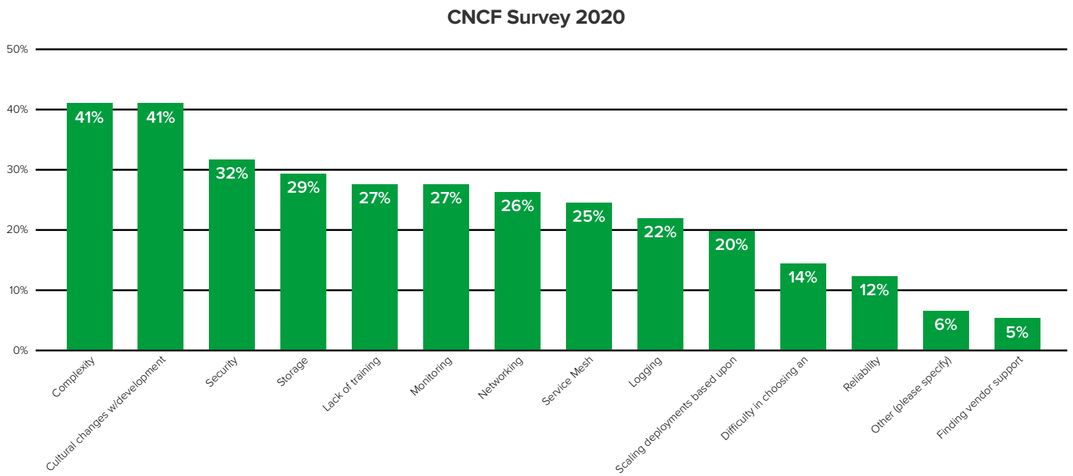
However, with great opportunity comes increased complexity...

... and there comes a time when complexity becomes too great to handle with native Kubernetes tools.

Tools with limited feature sets and no support may suffice when teams are running Kubernetes in testing or low-volume production, but as apps grow in popularity, so do their performance, functionality, and resource requirements – not to mention the risks.

In fact, 41% of organizations believe complexity and cultural changes relating to development are among their biggest challenges. Even more frustrating for organizations is that this overwhelming difficulty can strike at different times, not just at the beginning of a journey where knowledge is limited or later as application traffic and functionality requirements increase. Even the most forward-leaning Kubernetes adopters face challenges of this nature.

What challenges do organizations face when implementing containers?



Kubernetes challenges vary by organization and are based on their available resources and business needs.

A lack of in-house skills and experience is a common pitfall, as well as the need to deliver end-to-end security. Elsewhere, scalability is the problem as application traffic increases, teams become overwhelmed by administration, visibility over the application landscape becomes foggier, and networking intricacy introduces management challenges.

Even if these challenges aren't impacting your organization right now, Kubernetes is unlikely to get any less complex over time. Readying your organization for potential problems now will help your microservices journey continue more smoothly, overcoming existing issues while preparing the platform for upcoming challenges.

For instance, would your teams and environment be able to cope with the traffic if one of your applications saw a sudden popularity boost? Would you be able to ensure the security of that traffic? What about if a member of your team with a specific Kubernetes skill set were to leave or become unavailable? Is your environment set up for seamless onboarding?

But the picture doesn't have to be quite so negative.

Let's take a look at your current environment and explore how you can overcome the complexity of Kubernetes and prepare your organization for the future...

Where is your organization on its Kubernetes adoption journey, and what challenges are you facing?

Depending on whether you're yet to start, testing the water, or running Kubernetes in production, you're likely facing challenges specific to the maturity of your environment.

Take a look at the different levels and determine where you are on your adoption journey.

Which level of Kubernetes maturity best describes your organization?

Beginner

Monolithic apps running in VMs.

You're investigating Kubernetes or have begun using it but lack the knowledge, experience, or training required to take it from testing to production.

Intermediate

Apps being rearchitected for microservices.
Infrastructure migrating to Kubernetes in test.
One or two non-critical apps on Kubernetes.

You've established a Kubernetes environment but are hitting roadblocks when it comes to complexity, security, visibility, or scalability. Possibly all of the above.

Advanced

Applications fully microservices-based with production apps running in Kubernetes.

You have a fully-fledged Kubernetes environment in place but are facing complex challenges and architecture decisions, such as how to enable end-to-end encryption.

Kubernetes Level: **Beginner**

The Kubernetes Challenge You Can Overcome with NGINX:
GET UP AND RUNNING

Your situation

You're no doubt interested in the potential benefit Kubernetes could bring to your business.

Whether you're investigating the solution or taking your first steps toward testing application development in a containerized environment, you're likely aware of the skills and experience gaps that exist within your business. Kubernetes can feel quite overwhelming at this early stage, especially if your organization must also shift culture and mindsets away from traditional processes and towards a DevOps approach.

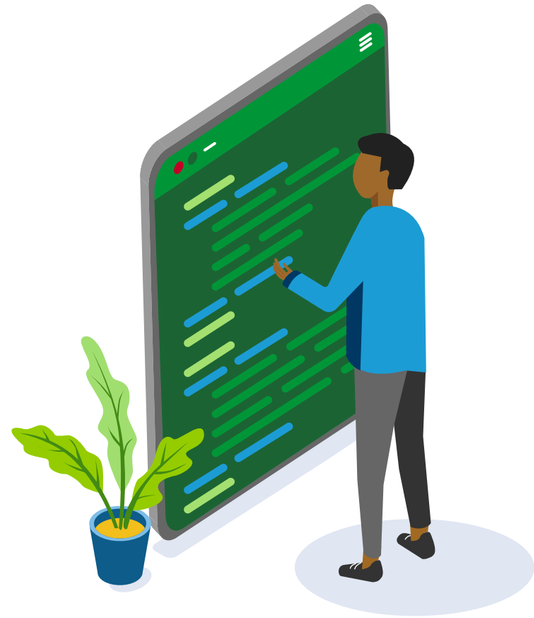
Your solution

Believe it or not, you're in a great position.

With a blank canvas ahead of you and the right support from the outset, you can avoid many of the common pitfalls other businesses encounter as they embark on digital transformation and application modernization journeys.

By talking to NGINX about your business goals and requirements, you can start your journey on the right foot. We can help you understand the tools you need to drive your environment forward, helping you to plan carefully before making the transition from testing into production. What is often a perilous process of trial and error can be made painless and become your organization's competitive advantage.

Take a look at how NGINX solutions for Kubernetes could help your business as you begin your microservices journey, or get in touch with us to find out more:



Kubernetes Level: **Intermediate**

The Kubernetes Challenge You Can Overcome with NGINX:
BETTER MANAGE TRAFFIC AND SECURITY

Your situation

Your Kubernetes journey started well, but now, with applications in production and demands increasing, the complexity is beginning to mount.

Managing traffic has likely become more difficult as usage increases and new functionality is added. Introducing new tooling and code for each individual part of the application has become time-consuming and impacts visibility, while scaling your environment and monitoring performance is also taxing. Security could well be a major concern as your environment matures, and you're probably struggling to manage authentication and authorization.

Your solution

Introducing a production-grade Ingress controller and a web application firewall (WAF) could reduce many of your current headaches, enabling you to secure, strengthen, and scale your Kubernetes apps.

A high-quality Ingress controller marks the first step in overcoming the complexity within your environment. Providing enhanced visibility and control over ingress-egress traffic, it also enables you to do more than a standard load balancer, including increasing resiliency and enabling rapid scalability.

Integrating a WAF into your Ingress controller enables you to secure the application perimeter. With the right architecture, the Ingress controller is the entry point for traffic which makes it an ideal location to deploy a WAF as it's far closer to the applications it protects. It also eliminates the need for a separate WAF device, reducing complexity, cost, and points of failure.

Take a look at how NGINX solutions for Kubernetes could help your business as you move further on your microservices journey, or get in touch with us to find out more:

Kubernetes Level: **Advanced**

The Kubernetes Challenge You Can Overcome with NGINX:

TAKE CONTROL OF KUBERNETES & IMPLEMENT END-TO-END SECURITY

Your situation

You've fully invested in Kubernetes as your production environment, have a mature production CI/CD pipeline, and complex, distributed applications with multiple API dependencies.

You have clearly identified business outcomes based on the development of modern apps; however, several factors are inhibiting that success. Complex architecture challenges and decisions need to be made as networking traffic becomes increasingly difficult to manage, and you may also need to maintain or implement a zero-trust production environment.

Your solution

To address the complexity and security challenges you face, a production-grade solution is required to help you take control of Kubernetes and achieve your goals through modern apps.

Now is the time to introduce a service mesh. However, rather than simply choose the mesh with the most features, you should focus on the functionality your environment truly needs. It should be platform-agnostic and include a fully integrated, high-performance data plane with an integrated Ingress controller and web application firewall to enable you to reduce application networking complexity and enable the administration of application policies.

Take a look at how NGINX solutions can help overcome your challenges as you take the next step toward a production-grade Kubernetes environment, or get in touch with us to find out more:

The importance of the data plane

Let us tell you the secret to achieving production-grade Kubernetes: it's a high-performance data plane.

As one of the three main components of a Kubernetes environment, alongside the management plane and control plane, the data plane moves traffic within and between your apps, across nodes, pods, containers, and application services.

Given the crucial role of the data plane, ensuring it's of the highest quality is essential. If it's slow, it'll slow down your apps. If it's too complex, managing your applications and traffic will be far harder. If it's not secure, your app security will suffer.

Not only that but, given that the data plane is the last component to touch traffic before it reaches your application, end-to-end security will be impossible to achieve without a high performance, secure data plane. In short, the data plane directly affects the downtime, security, cost of ownership, and overall success of every application it controls.

NGINX Ingress Controller with NGINX App Protect

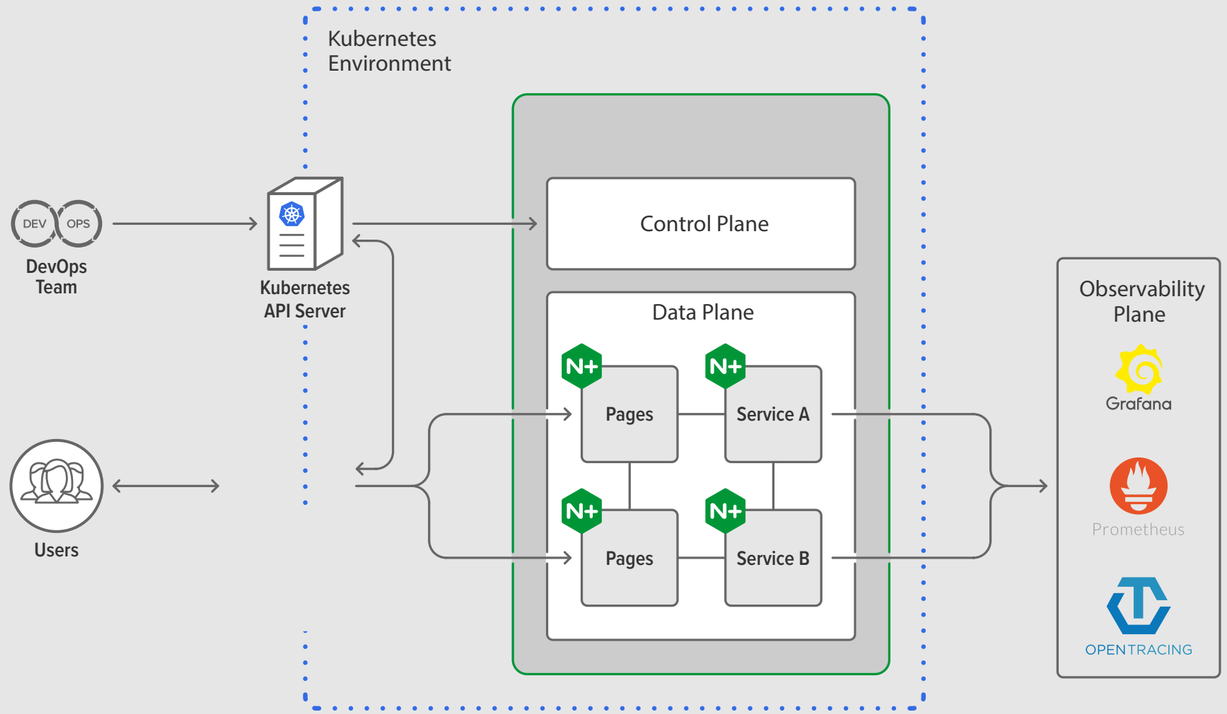
The first step in a unified control plane is NGINX Ingress Controller, which becomes the only point of entry for data plane traffic. This makes it the ideal place for NGINX App Protect to deliver WAF functionality closer to your application code.

NGINX Service Mesh sidecars

NGINX Plus delivers transparent load balancing, reverse proxy, traffic routing, identity, and encryption features needed for production-grade service mesh deployments.

The NGINX data plane

The fully integrated NGINX data plane delivers highly available and scalable containerized environments and brings a level of enterprise traffic management, performance, and scalability to the market that others can't match.



NGINX Ingress Controller

NGINX Ingress Controller is a best-in-class traffic management solution for cloud-native apps in Kubernetes and containerized environments.

NGINX is the most commonly used data plane in Kubernetes Ingress controllers, used to enable high-performing, scalable, and secure modern apps in production.

NGINX Ingress Controller combines trusted NGINX software load balancing with simplified configuration based on standard Kubernetes Ingress resources or custom NGINX Ingress resources to ensure that applications in your Kubernetes cluster are delivered reliably, securely, and at high velocity.

Why use NGINX Ingress Controller?

Feel confident with a stable, reliable Ingress Controller tested by NGINX and covered by 24x7 support.

Mouse over each item to learn more

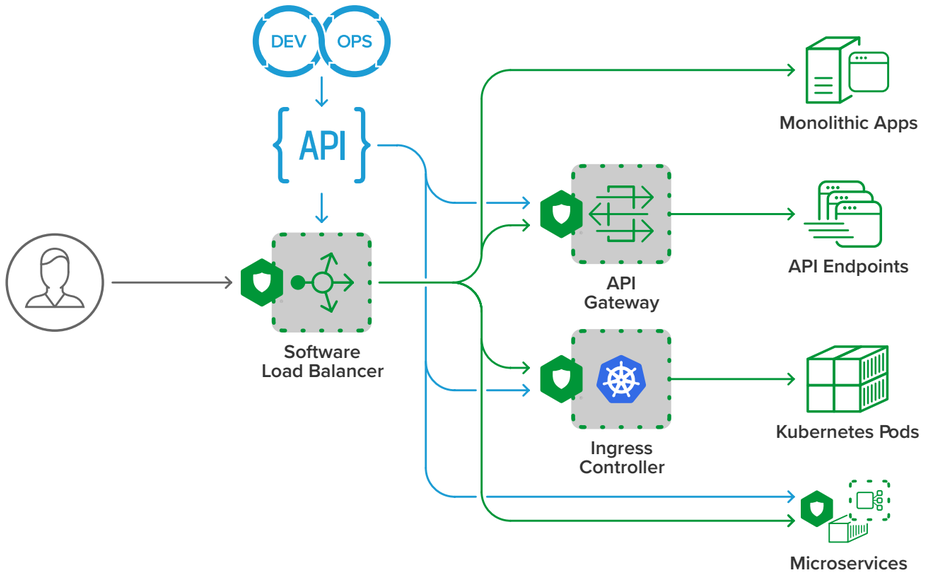
What else can NGINX Ingress Controller do?

Mouse over each item to learn more

NGINX App Protect

NGINX App Protect is an enterprise-grade web application firewall for protecting applications and APIs.

It enables authorized security controls to be integrated into CI/CD pipelines without slowing release velocity or performance. A modern application security solution designed to work seamlessly in DevOps environments, NGINX APP Protect is built on F5's market-leading WAF and bot protection and can be deployed on NGINX Ingress Controller to reduce single points of failure and provide developer-friendly security closer to the services.



Why use NGINX App Protect?

Implement cost-effective security controls without impacting release velocity or application performance.

Mouse over each item to learn more

What else do you get with NGINX App Protect?

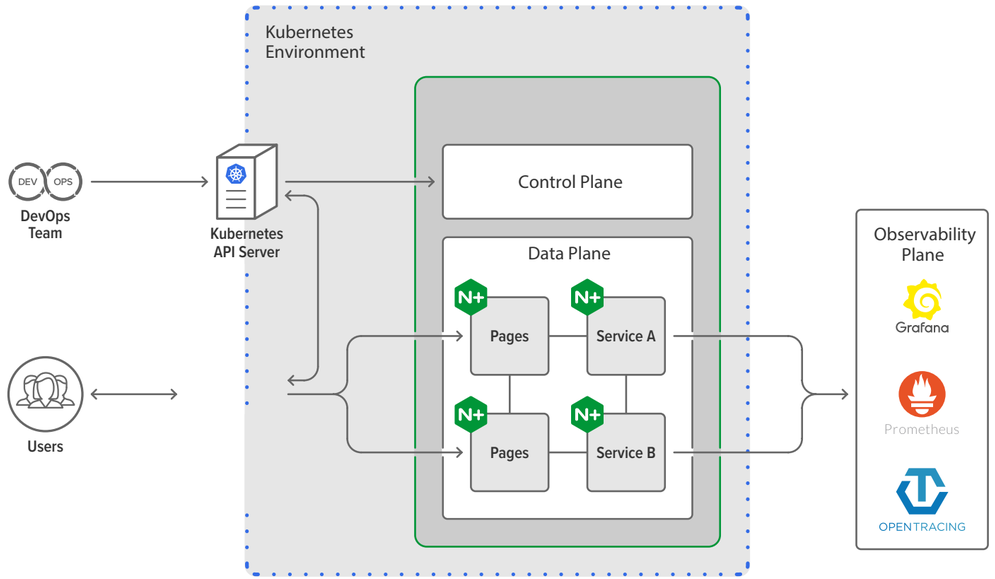
Mouse over each item to learn more

NGINX Service Mesh

NGINX Service Mesh is the simplest, most developer-friendly mesh solution on the market.

It manages service-to-service traffic within Kubernetes environments, reduces application networking complexity, and enables the administration of application policies to deliver multiple benefits, including end-to-end security.

Lightweight and seamless by design, NGINX Service Mesh scales from open-source projects to a fully supported, secure, and scalable enterprise-grade solution, no matter where you are in your microservices journey. Take control of Kubernetes with our turnkey, secure, service-to-service solution featuring a unified data plane for ingress and egress management in a single configuration.



Why use NGINX Service Mesh?

A lightweight, turnkey, and developer-friendly service mesh using NGINX Plus as an enterprise sidecar.

Mouse over each item to learn more

What else can NGINX Service Mesh do?

Mouse over each item to learn more

Why NGINX?

NGINX enables organizations to quickly establish production-grade Kubernetes environments that meet the growing needs of their business, its applications, and industry regulations.

Whether you're dealing with a lack of Kubernetes knowledge or issues relating to security, visibility, scalability, and traffic management, NGINX provides the enterprise-grade tooling to overcome these challenges and simplify Kubernetes environments.

Leveraging the agility and market-leading performance of NGINX, you can transform and futureproof operations by moving beyond basic functionality to a higher quality, unified data plane.

With NGINX, you can...

- **Enhance performance**
- **Reduce complexity**
- **Increase security**
- **Overcome capability gaps**
- **Diminish admin burdens...**

...and achieve the secure, fast-paced app deployment and automated, self-sustaining environments that Kubernetes promises.

TAKE THE NEXT STEPS WITH NGINX

Get in touch to find out more about NGINX for Kubernetes environments and access the support you need to take the next step on your microservices journey.

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