



# 5 challenges faced by educators and state & local governments to achieving observability at scale

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Using automation and intelligence to overcome obstacles.



# Introduction

Successful digital transformation among educational institutions, state and local governments requires every application and digital service, and the dynamic multi-cloud platforms they run on, to work perfectly. All the time. With the majority of universities having to shift to online learning and many state and local governments forced to make access to service easier, the pressure to transform has never been greater.

But these dynamic, highly distributed cloud-native technologies are fundamentally different than their predecessors. The resulting complexity brought on by microservices, containers, and software-defined cloud infrastructure is overwhelming at web scale. It's all beyond the limits of human teams to manage and scale on their own.

To understand everything going on in these ever-changing environments, all of the time, observability needs to scale.

## What teams are up against

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The complexity of dynamic multi-cloud environments in a higher education or government environment.

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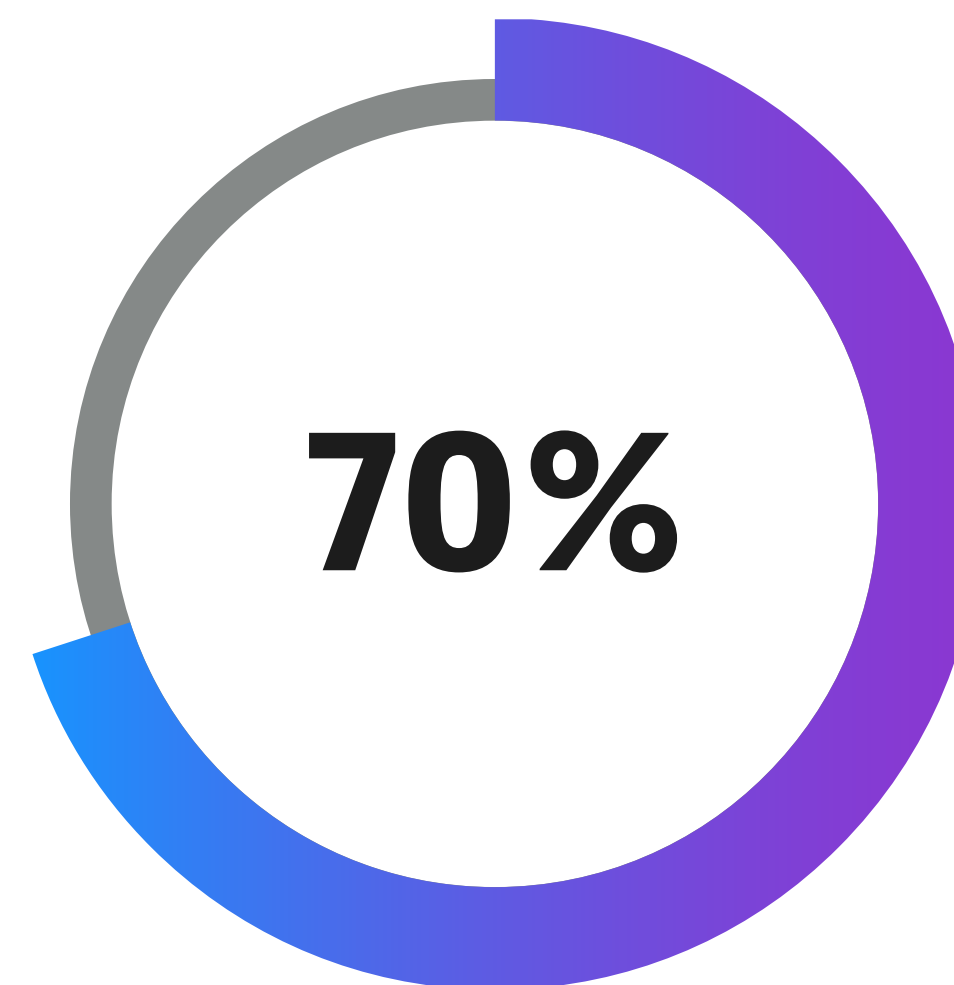
### Challenge Five

Knowing what efforts drive positive business impact

## More tools aren't the answer

Some teams within higher education and government mistakenly try to solve this 'observability at scale' problem by adopting more siloed monitoring tools — and spending more time on manual configuration, incurring more technical debt, and struggling to identify issues and prioritize efforts with the greatest impact.

As cloud complexity continues, this approach becomes increasingly unsustainable for even the most experienced teams, who are continuously bogged down in manual-intensive tasks that decrease effectiveness to achieving what matters most.



of organizations are struggling to cope with the number of alerts they receive from monitoring and management tools

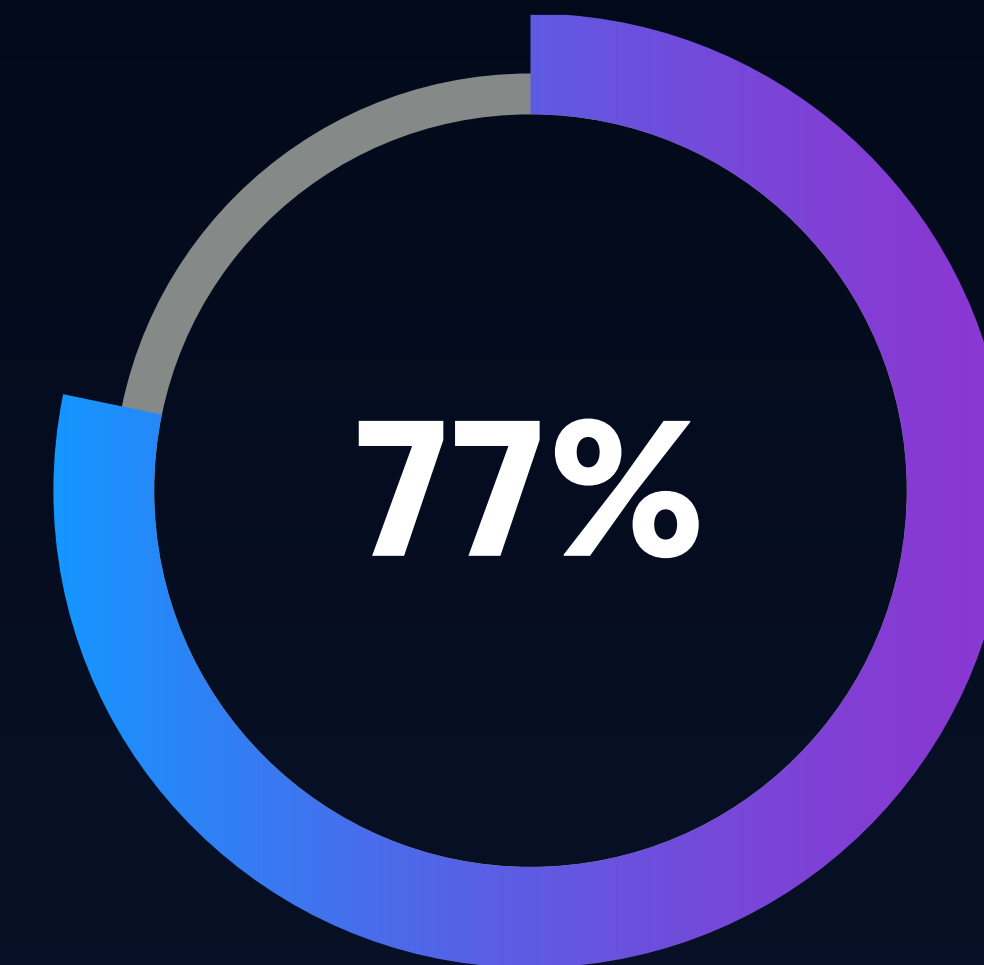
– source *Dynatrace Global CIO Report 2020*

# The shift to intelligent observability

To scale observability, **universities and government entities must fundamentally transform the way they work** to innovate faster, keep up with constantly changing tech stacks, and reduce risk across teams.

This scale happens when teams shift from simply observing and reacting to issues as they arise, to a culture of proactive understanding and optimization. This unlocks the ability to anticipate, predict and even auto-remediate problems that matter most to the business.

In deciding how to accelerate digital transformation, both educators and governments need to understand that every decision is an investment in achieving the original goal of observability: to proactively and efficiently improve user experiences that drive business growth.



of executives state that their technology architecture is becoming very critical or critical to the overall success of their organization.

— Source: Accenture: Technology Vision 2021

# Automation and intelligence are essential higher ed. or government institution

Whether selecting a DIY approach, buying another cheap tool, or investing in a strategic platform, everything costs time, money, people, and quality. Prioritizing value and speed of delivery to students, staff and citizens is paramount to finding success in this dynamic multi-cloud world.

Automation and intelligence are essential to transform how teams work to quickly and efficiently achieve observability at enterprise scale.

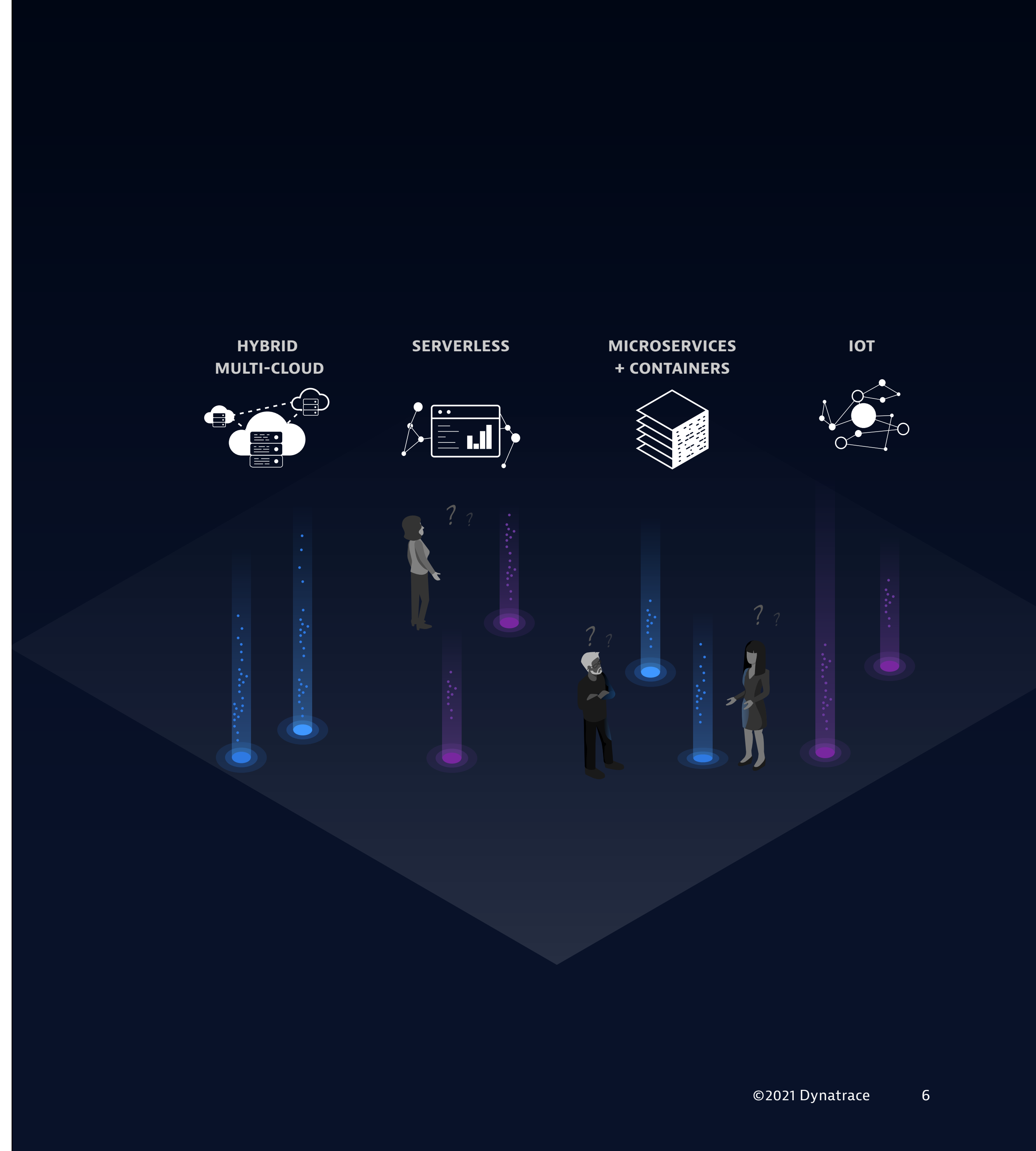
Requirements		Results
Complete coverage	→	More productivity and time to innovate
Automation everywhere	→	Higher quality releases
Real-time feedback	→	Better customer experiences
Precise answers	→	Reduced risk
Cross-collaboration	→	Accelerated business outcomes

## Challenge 1:

The complexity of dynamic multicloud environments in a higher education or government environment

The rate at which new technologies are available and implemented in these unique environments is increasing; exploding the complexity that results from unmanageable volumes and speed of data emitted by dynamic environments.

This makes it near impossible for IT teams to manually understand how everything is related in context, all of the time. **So, teams must find ways to automate the understanding of this data and context to accelerate digital transformation, which will lead to an improved user experience.**



## Education and government IT teams often fail at digital transformation because they're:



**Hindered by disconnected data silos** that prevent understanding of entity relationships and interdependencies

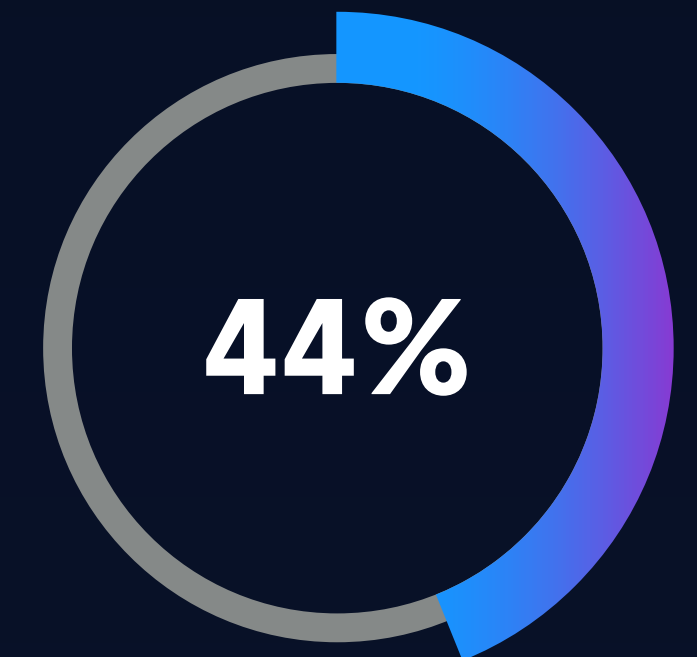


**Lacking understanding and context** of upstream and downstream system impacts from potential changes



**Forced to prioritize manual instrumentation** and mundane tasks over developing new features

**These shortcomings introduce unnecessary risk and burden developers with repetitive toil,** ultimately hurting digital transformation efforts and driving innovation forward, something that governments and universities institutions are looking to in order to digitally transform.



of an IT teams' time is spent on manual tasks, on average.

— [Dynatrace 2020 Global CIO Report](#)



# How to overcome it

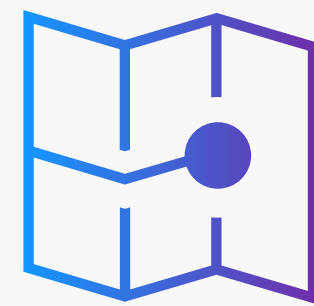
Automation is an absolute necessity to not only handle the scale of every single component in a government or educational ecosystem, but also understand all the interdependencies.

You can't hire your way to observability at scale. Understanding dynamic multicloud environments requires an automated approach that can multiply productivity of your existing team and shift effort from manual tasks to driving tangible business results.



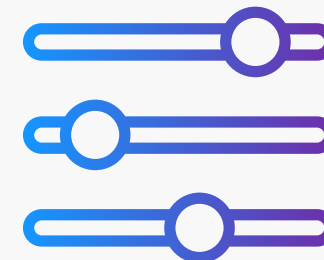


**To scale observability and eliminate blind spots** across increasingly complex and expanding environments, IT that operate within higher education, state or local government teams need automation powered by:



**Topology mapping**

that continuously maps components, cloud services, and ever-changing relationships between potentially billions of interdependencies



**Auto-discovery**

of new components to prevent gaps in coverage in real-time



**No-code approach**

to better leverage skilled developers on proactive optimization efforts and business-driving innovation projects

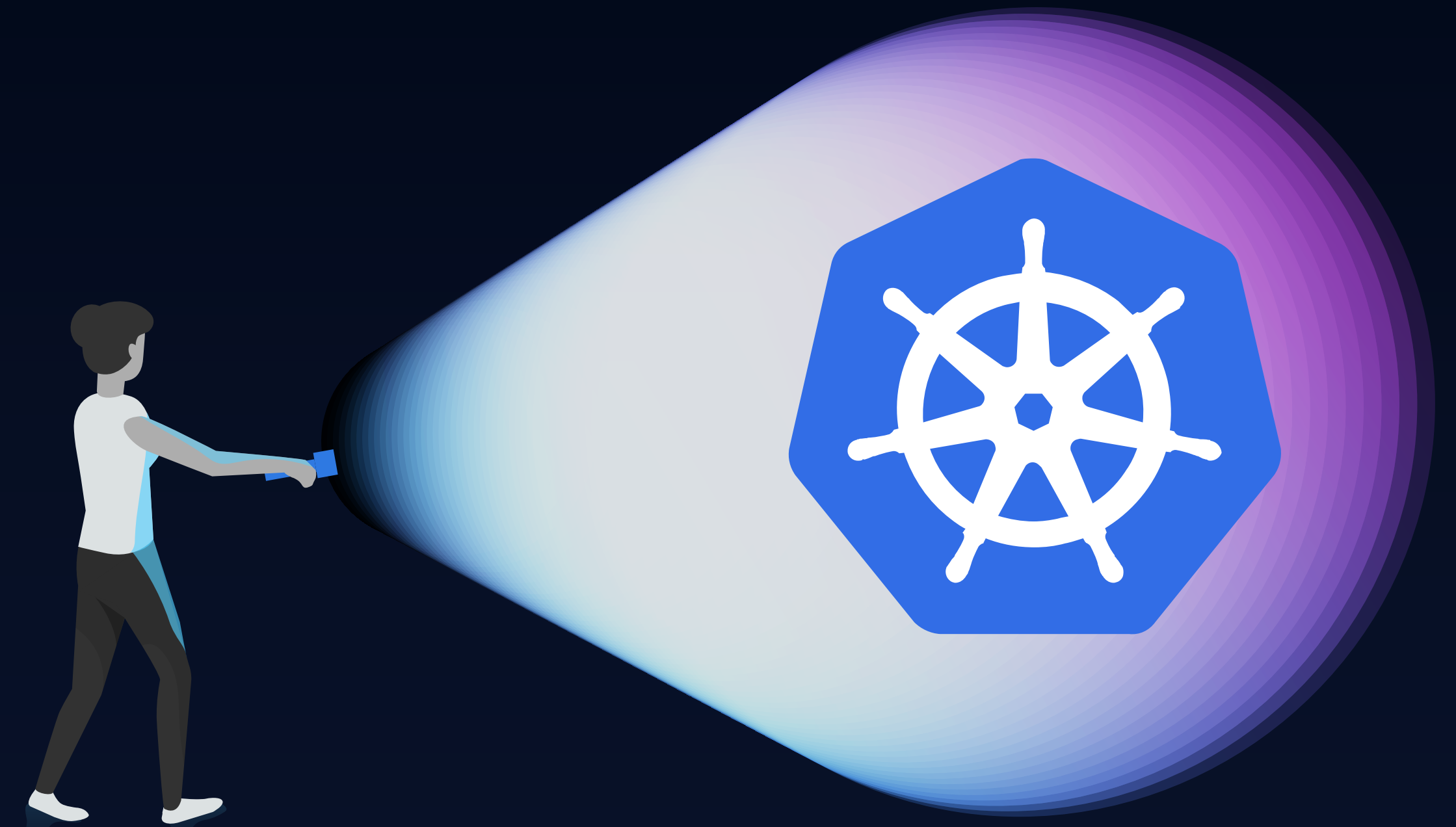
**This continuous automation and always-on context gives teams confidence in keeping up with dynamic technology stacks to digitally transform faster,** without the ongoing burden of constant deployments and manual maintenance in attempt to slowly gain more coverage and understanding.

## Challenge 2:

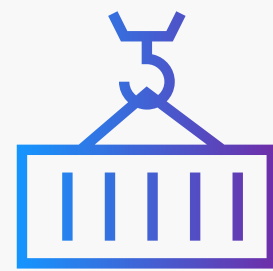
# Monitoring dynamic microservices and containers in real-time

Short-lived containers and microservices, like those managed in Kubernetes, provide the required speed and agility to successfully modernize. However, the dynamic nature of technologies that can spin up and down within seconds introduces several major issues to scaling observability for these technologies.

This all results in a lack of understanding of internal states of the application, other interdependent components that microservices rely on, and even the impact on users.



**Governmental and university IT teams are still blind to what's happening in their dynamic environments**  
and actioning on incomplete data because they:



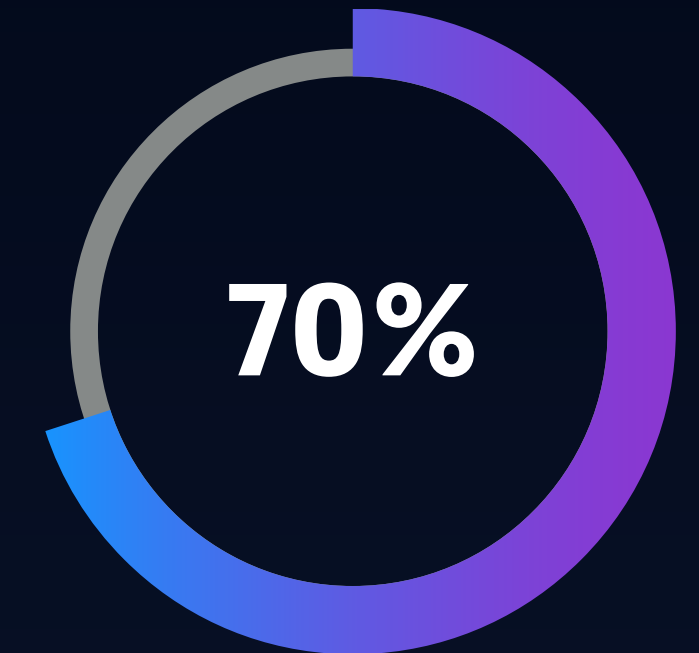
**Don't understand the relationships**  
between containers  
and upstream components  
that can impact them



**Can't connect end-to-end tracing from real users**  
accessing these microservices,  
to the nodes, the services  
and containers they run on



**Lack real-time visibility**  
into exactly what's inside  
the workloads running  
within containers

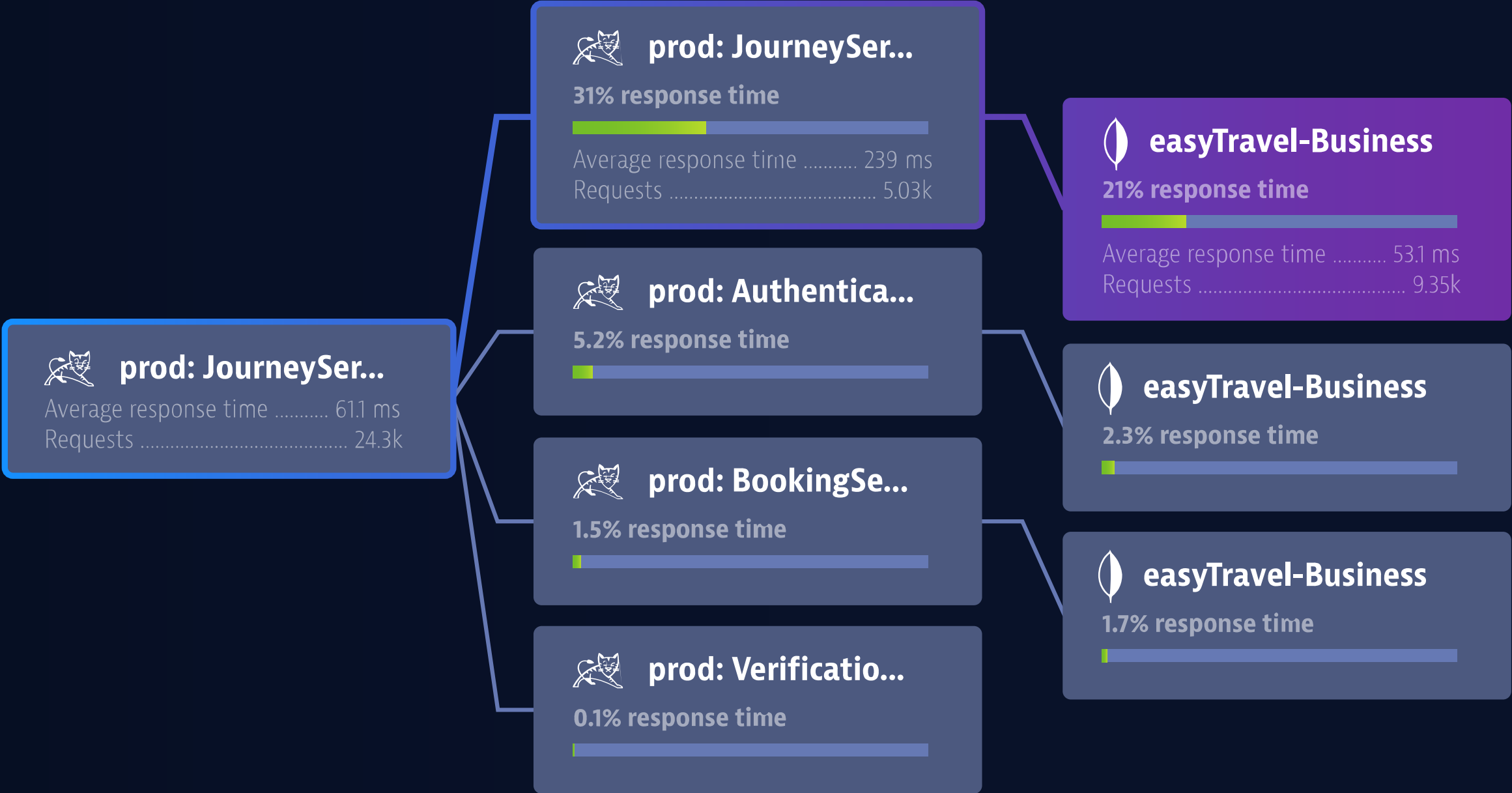


of CIOs say  
monitoring containerized  
microservices in real-time  
is almost impossible

— [Dynatrace 2020 Global CIO Report](#)

# How to overcome it

Educational organizations and governments of all sizes need observability to scale across their multicloud, including cloud, legacy, and hybrid environments, to handle the dynamic nature of Kubernetes and containers.



To ensure everything's accounted for, no matter how short lived,  
**government and education focused teams need  
real-time intelligence and automation with:**



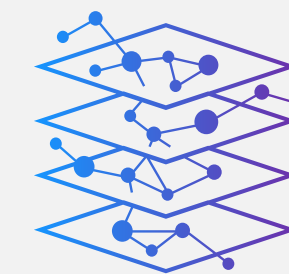
**Automatic discovery**

of containers at start-up,  
along with all things running  
inside each workload



**Topology context**

external to containers,  
since anomalies often occur  
outside of Kubernetes  
nodes, pods, containers,  
and clusters



**Full-stack visibility**

all the way from the pod,  
through the cloud provider  
and application, to the user  
to understand the end-to-end  
business impact

With this speed, automation, and context applied to containers and microservices,  
**governmental and higher ed. IT teams can continuously understand system behavior  
and the true origin of anomalies can be easily isolated and precisely pinpointed at scale.**

## Challenge 3:

# The volume, velocity, and variety of data and alerts

Dynamic multi-cloud environments are exponentially increasing the amount of telemetry data emitted, and overwhelmed teams are still stuck trying to monitor every data point and make sense of it all.

Already constrained both education and government IT resources are stuck reacting to each new problem after users and business goals are already impacted, trying to observe what's happening by manually building, maintaining, and constantly watching potentially thousands of dashboards.



However, **this approach doesn't scale among complex government and higher education environments** and persists the same challenges that cannot be solved using the same manual-intensive philosophy:



**Defining and redefining "normal"** for anomaly thresholds that constantly change with dynamic environments and seasonality



**Monitoring "unknown unknowns"** — issues you aren't aware of, don't understand, and don't monitor



**Siloed data sending mixed signals** that multiply alert storms, intensifying team fatigue and unnecessary war rooms



**Multiple teams struggling to pinpoint issues** across different tools to guess the root cause, causing more finger-pointing and blaming

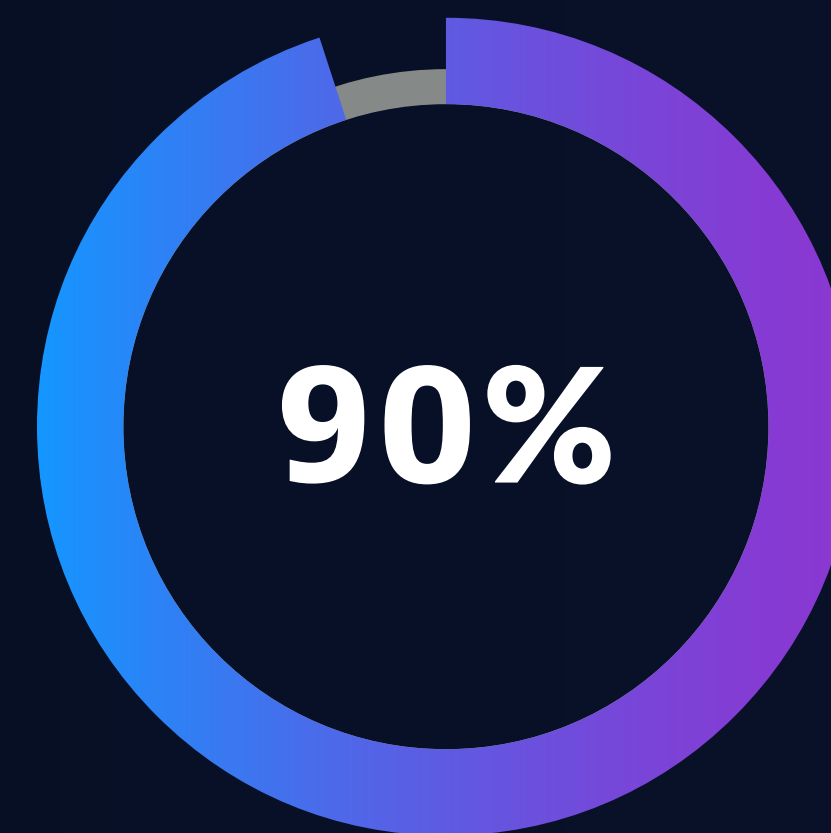
**All of this forces IT teams to spend even more of their time "keeping the lights on"** by guessing about the problem, priority, and diagnosis, rather than continuously optimizing and resolving issues before users are impacted.



# How to overcome it

It's clear that AI is needed to continuously and instantly understand when and why anomalies occur. But the only way to transform from reactive to proactive, is having an AI that doesn't need to learn or be trained.

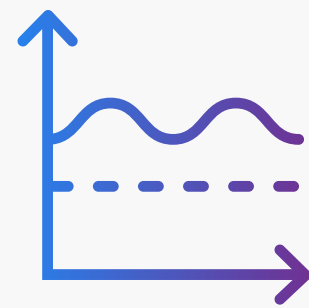
Because dynamic multi-cloud environments can change within seconds, AI needs to know precise answers and be able to anticipate and auto-remediate issues before business impact.



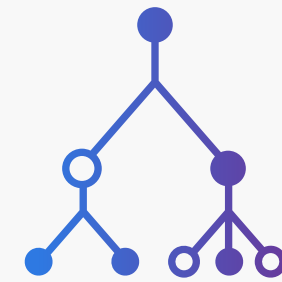
of executives state that multiparty systems will enable their ecosystems to forge a more resilient and adaptable foundation to create new value with their organization's partners.

—Source: Accenture – Tech Vision 2021 Study

A few critical capabilities of AI  
that **enable observability at scale:**



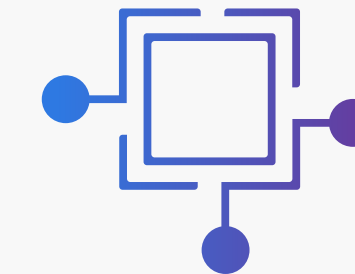
**Auto-adaptive threshold baselining** for anomaly detection to prioritize what really matters



**Intelligent grouping of related anomalies** into a single problem to eliminate redundant work across teams



**Always-on causation-based AI with code-level analysis** that processes billions of dependencies with complete fault tree analysis to instantly deliver answers



**Integrating answers with context** from external systems (like ServiceNow and other ITSMs) to broaden workflow automation across multiple teams

The goal of causation-based AI is to provide answers to engineering, infrastructure, operations, and application teams and empower them to focus on the things that matter. **Delivering one precise answer for each issue that everyone understands can transform teams away from finger-pointing to efficient cross-team collaboration that drives better outcomes for education and governmental institutions and their users alike.**

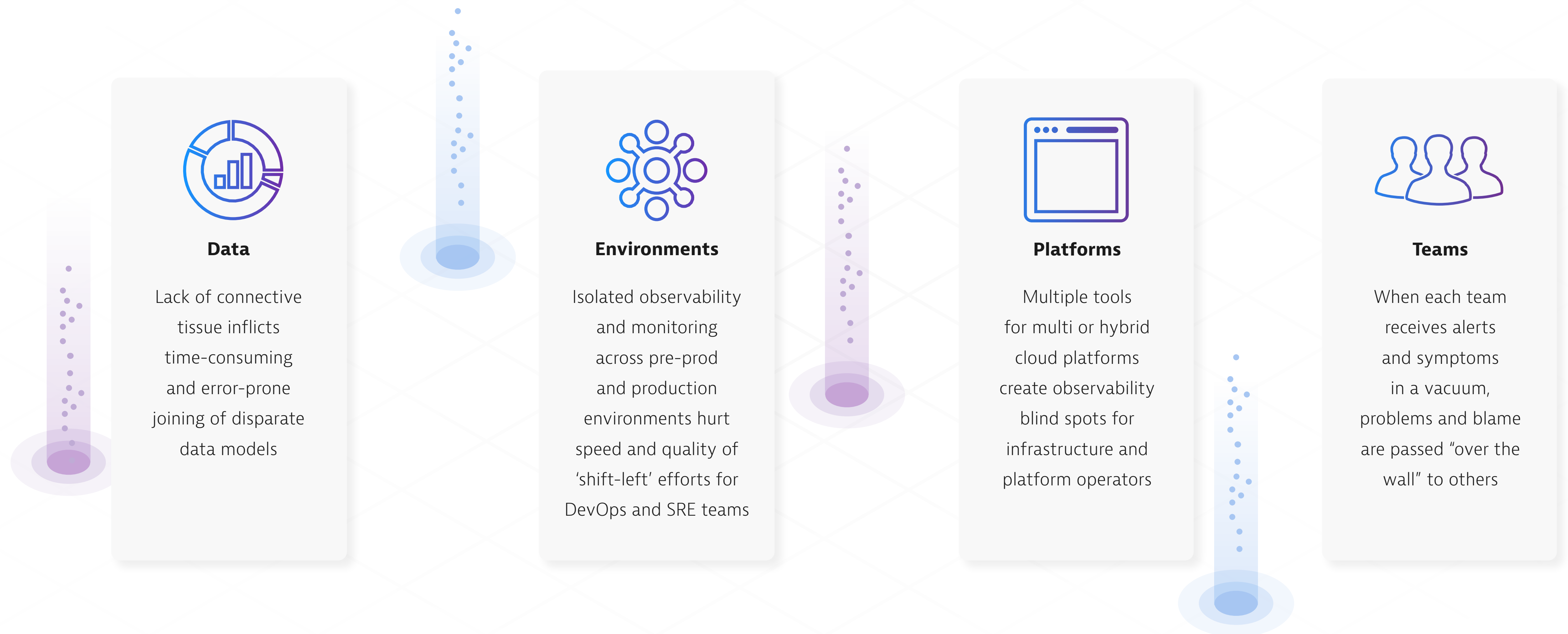
## Challenge 4:

# Siloed Infra, Dev, Ops, Apps, and Biz teams

New cloud-native technologies require more solutions to instrument and monitor, but teams are already drowning in tool sprawl. This tool sprawl aggravates silos that hurt innovation, decrease software quality, and reduce collaboration.



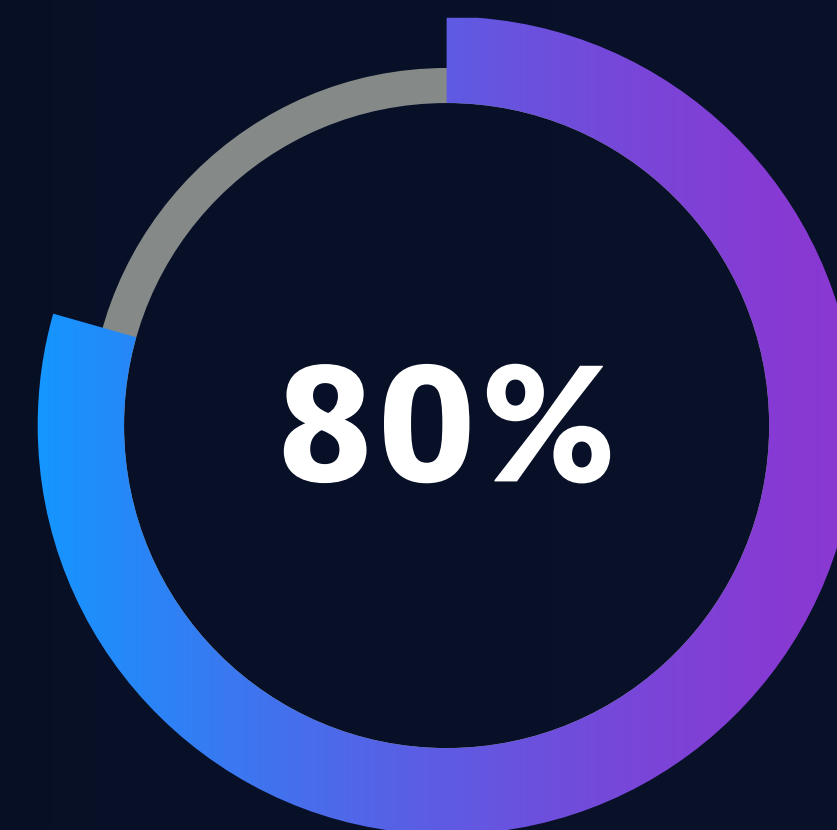
**Each different tool and point solution amplifies these silos,**  
with the negative effects spreading across each team that continues to struggle identifying and resolving issues and optimizations with the highest impact. This lack of vision can have a profound impact on delivering an exceptional experience to students, staff and citizens.



# How to overcome it

To eliminate these silos, a solution can't simply stitch it all together. It has to bring together teams through a single common language. Bridging these gaps with a single source of truth removes confusion and multiplies productivity across teams.

This cross-team collaboration and more efficient working environment boosts the speed of value-add product features and optimizations that **drive better user experiences.**



(480) of 600 global IT leaders surveyed agree that the convergence their organization experienced during the last 12 months is a result of deliberate efforts to break down silos between ITOps and DevOps

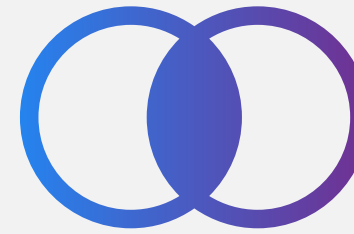
— Source: Logic Monitor - The Race to IT Observability 2021

Several key requirements **enable teams to collaborate more efficiently** towards the same technical and business SLIs/SLOs:



**Single data model  
to scale observability**

across all layers and  
components across  
the full tech stack



**Shared context that  
facilitates cross-team**

**collaboration,** with  
flexibility to slice and  
dice across infrastructure,  
applications, operations,  
and business data



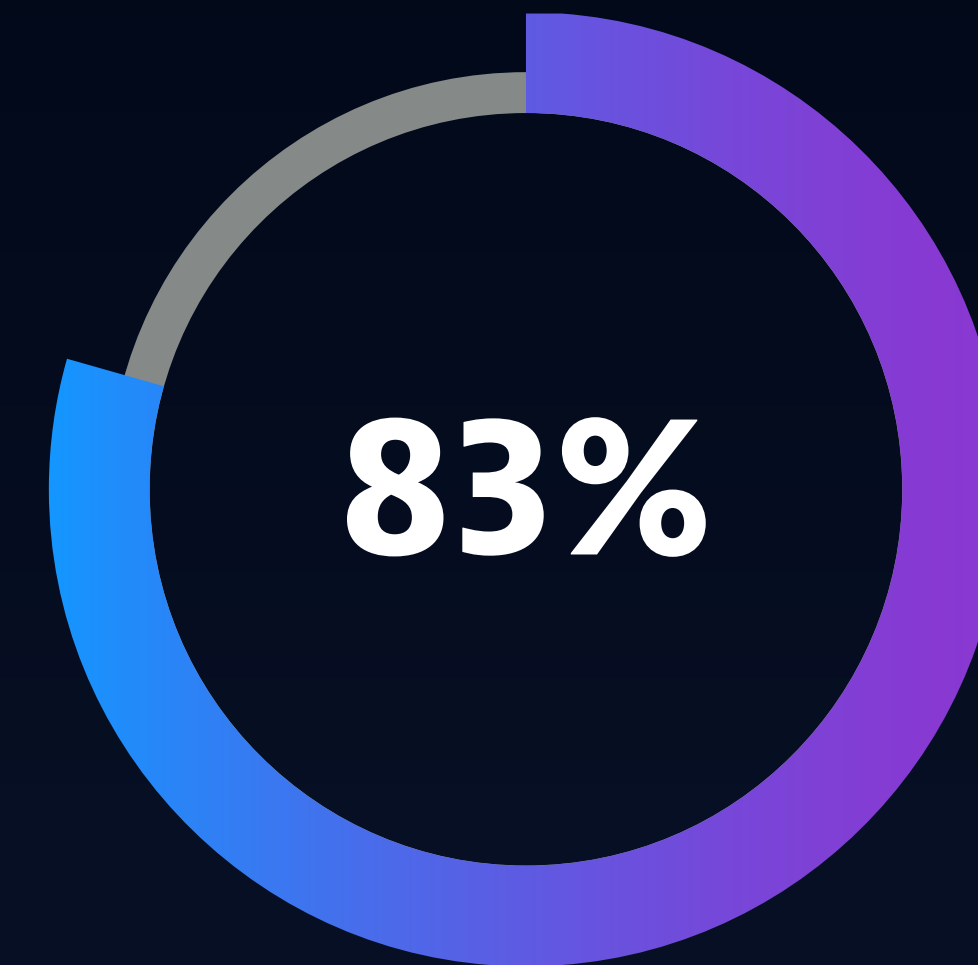
**Seamlessly tying together  
the entire software lifecycle**

from feature development,  
testing, releases, and ongoing  
optimizations to innovate  
faster with higher quality

## Challenge 5:

# Knowing which efforts drive positive business impact

Even with complete visibility to back-end components, a lack of front-end user perspective diminishes much of the tangible value that organizations aim to achieve with observability efforts.

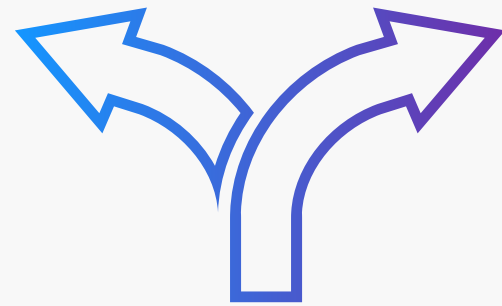


of executives agree that their organization's business and technology strategies are becoming inseparable — even indistinguishable

— Source: Accenture – Tech Vision 2021 Study



Without front-end application performance,  
**major risks to the end-user experience are exposed:**



**Disconnected front-end  
and back-end perspectives,**

hurting understanding of  
technology's impact on users  
and business objectives



**Critical blind spots**

like mobile app crashes,  
3rd party services, CDN,  
and front-end errors  
still exist



**Disparate solutions**

to attempt observability  
for mobile and edge-device  
channels, forcing teams  
to leave some  
applications ignored



**No consideration  
of employees working  
from home,**

potentially  
damaging their ability  
to access required resources  
they need to deliver frictionless  
customer experiences

**Neglecting the end-user experience of applications obstructs the ability  
to prioritize optimizations and issues based on greatest business impact.**

When teams only look at technology by itself, IT efforts may not align with business priorities.

# How to overcome it

An outside-in user perspective of the application is needed to create a feedback loop from back-end technology teams to product, digital, and business teams, ensuring the entire cloud stack is supporting expected outcomes.

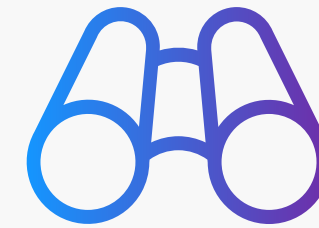


To include user experience into a more intelligent observability approach,  
**governments and institutions of higher learning alike organizations  
need to connect frontend back-end perspective to gain:**



**Complete insight  
of technology's impact**

on user experience  
and business KPIs like  
revenue, conversions,  
and feature adoption



**Observability and  
monitoring**

across web,  
mobile, and IoT to gain  
understanding to holistic user  
experience across channels



**All-in-one platform**

to optimize end-user  
experience for both customers  
and employees, no matter  
where they are in the world

**To achieve observability that scales across channels, citizens, employees, and all types of applications,  
back-end and front-end application performance must be connected.** Only then can teams across IT, product,  
and business prioritize and align efforts that drive the bottom line.

# Conclusion

To achieve observability at scale for dynamic multi-cloud environments in government and higher education at the speed needed to exceed end-user expectations and achieve goals, a fundamentally different approach is required.

Continuing to waste effort on manual instrumentation and configuration, digging through siloed data, and working on the wrong things prevents teams from making progress, and ultimately from achieving strategic business goals.

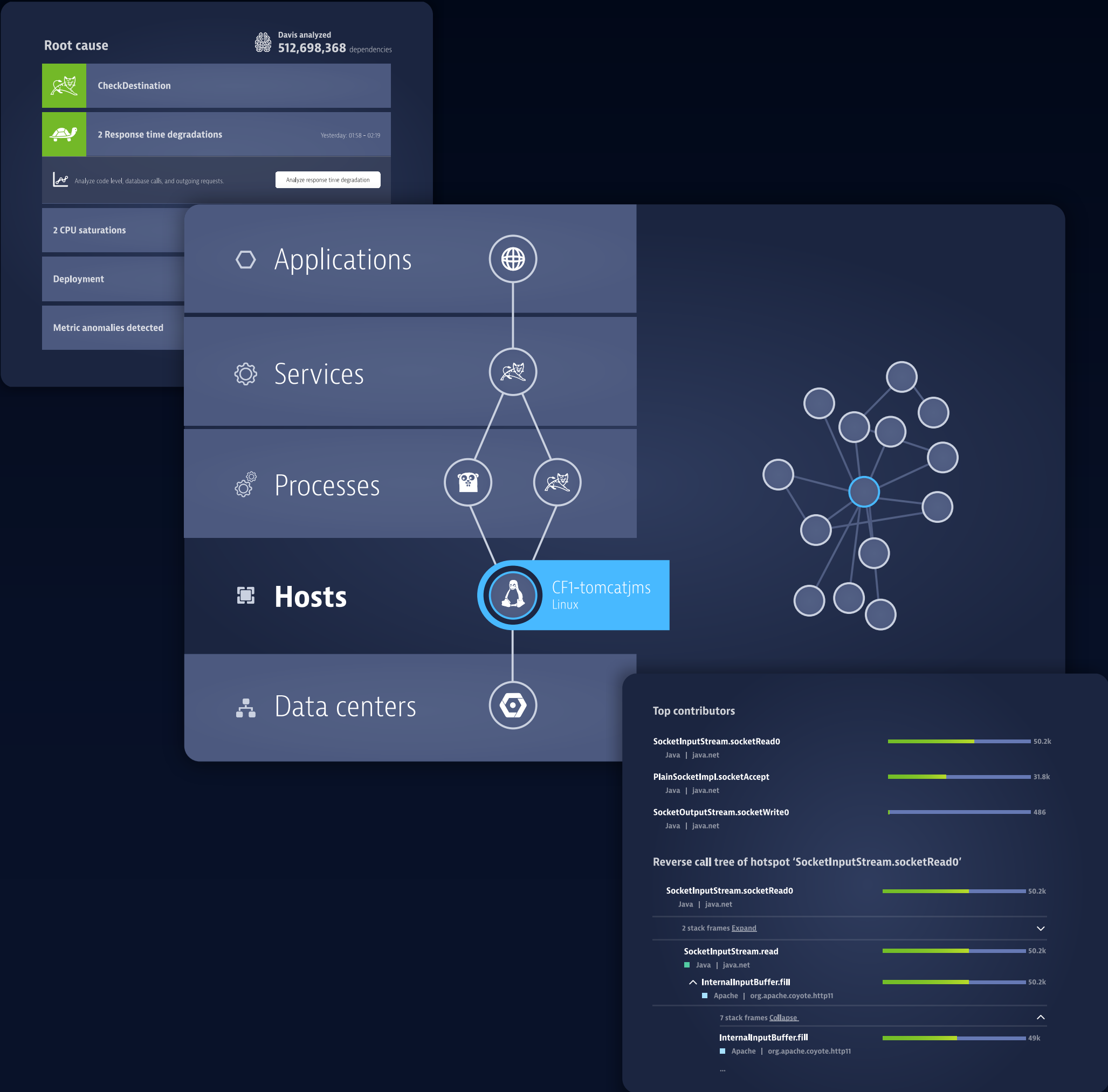
**Automated and intelligent observability is needed.**

**Dynatrace helps transform the way you work with:**

**Intelligent observability** — See it all down to code-level, at scale

**Continuous automation** — Stay ahead of modern, dynamic multi-clouds

**Precise Intelligence** — Go from guessing to knowing



# Our smarter approach to observability helps government and higher ed. teams turn AI into ROI,

**99%**

## Fewer IT tickets

From 700 tickets a week  
to just 7.



[Learn more](#)

**20%**

## Higher cart value

Order-from-table mobile  
application drives higher  
value than order from bar.



[Learn more](#)

**75%**

## Faster innovation delivered

With 75% MTTR and 4x  
productivity increase.



[Learn more](#)

# Software intelligence for the enterprise cloud

Click the link to take the next step in your higher ed. or government digital journey and see what Dynatrace can do for you.

**Learn more**

If you're ready to learn more, please visit [dynatrace.com/platform](https://dynatrace.com/platform) for assets, resources, and a **free 15-day trial**.



## About Dynatrace

Dynatrace provides software intelligence to simplify cloud complexity and accelerate digital transformation. With automatic and intelligent observability at scale, our all-in-one platform delivers precise answers about the performance of applications, the underlying infrastructure and the experience of all users to enable organizations to innovate faster, collaborate more efficiently, and deliver more value with dramatically less effort. That's why many of the world's largest enterprises trust Dynatrace® to modernize and automate cloud operations, release better software faster, and deliver unrivaled digital experiences.

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