

5 Key Considerations for Monitoring Microsoft Azure

Introduction

Software is taking over world. As a result, every business needs to embrace software as a core competency to ensure survival and prosperity. However, transforming into a software company is a significant task—building and running software today is harder than ever. And if you think it's hard now, remember, you are just at the beginning of your journey.

What's inside



Introduction

Software is taking over the world



Chapter 1

Hybrid, multi-cloud is the norm



Chapter 2

Microservices and containers introduce speed



Chapter 3

Not all AI is equal



Chapter 4

DevOps: Innovation's soulmate



Chapter 5

Digital experiences matter

Introduction

Speed and scale: a double-edged sword

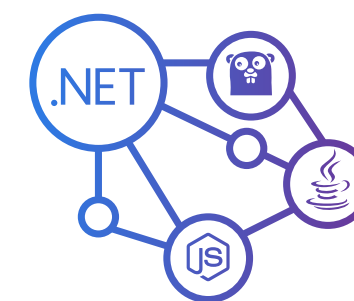
You invested in Microsoft Azure to build and run your software at a speed and scale that will transform your business—that's where Azure excels. But are you prepared for the complexity that comes with speed and scale? As software development transitions to a cloud native approach that employs microservices, containers, and software-defined cloud infrastructure, the complexity you will experience in the immediate future is more immense than the human mind can envision.

You also invested in monitoring tools. Lots of them over the years. But your traditional monitoring tools don't work in this new dynamic world of speed and scale that Azure enables. That's why many analysts and industry leaders predict that more than 50% of enterprises will entirely replace their traditional monitoring tools in the next few years.



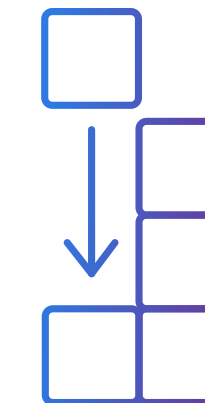
Manual effort

Slow, manual deployment and config coupled with manual upgrades and rework when environments change means a maximum of just 5% of apps are monitored



Agent complexity

Complex mix of agents for diverse technology types each with different deployment, installation, and configuration processes



Monitoring tool proliferation

Multiple monitoring tools for different purposes with siloed teams looking at myopic data sets



Just a bunch of charts

Data from multiple agents and different sources looks great but it's just a bunch of charts on a dashboard with no answers

Which brings us to why we've written this guide. We understand how important your software is, and why choosing the right monitoring platform is mandatory if you want to *live* by speed and scale, and not *die* by speed and scale.

We worked with your industry peers to arrive at our insights and conclusions

Dynatrace works with the world's most recognized brands, helping to automate their operations and release better software faster. We have experience monitoring the largest Azure implementations, helping enterprises manage the significant complexity challenges of speed and scale. Some examples include:

- A large retailer managing 2,000,000 transactions a second
- An airline with 9,200 agents on 550 hosts capturing 300,000 measurements per minute and more than 3,000,000 events per minute
- A large health insurer with 2,200 agents on 350 hosts, with 900,000 events per minute and 200,000 measurements per minute

Read on to reveal five critical factors that dictate the right monitoring platform for Microsoft Azure.

At Dynatrace, we experienced our own transformation, in which we learned to embrace cloud, automation, containers, microservices, and NoOps—and now we're prospering at the expense of those yet to transform. But don't just take our word for it, Forrester recognized our achievement and shared our story with the broader IT community to help them transform in the same way we have. You're welcome.

Dynatrace Transformation Report

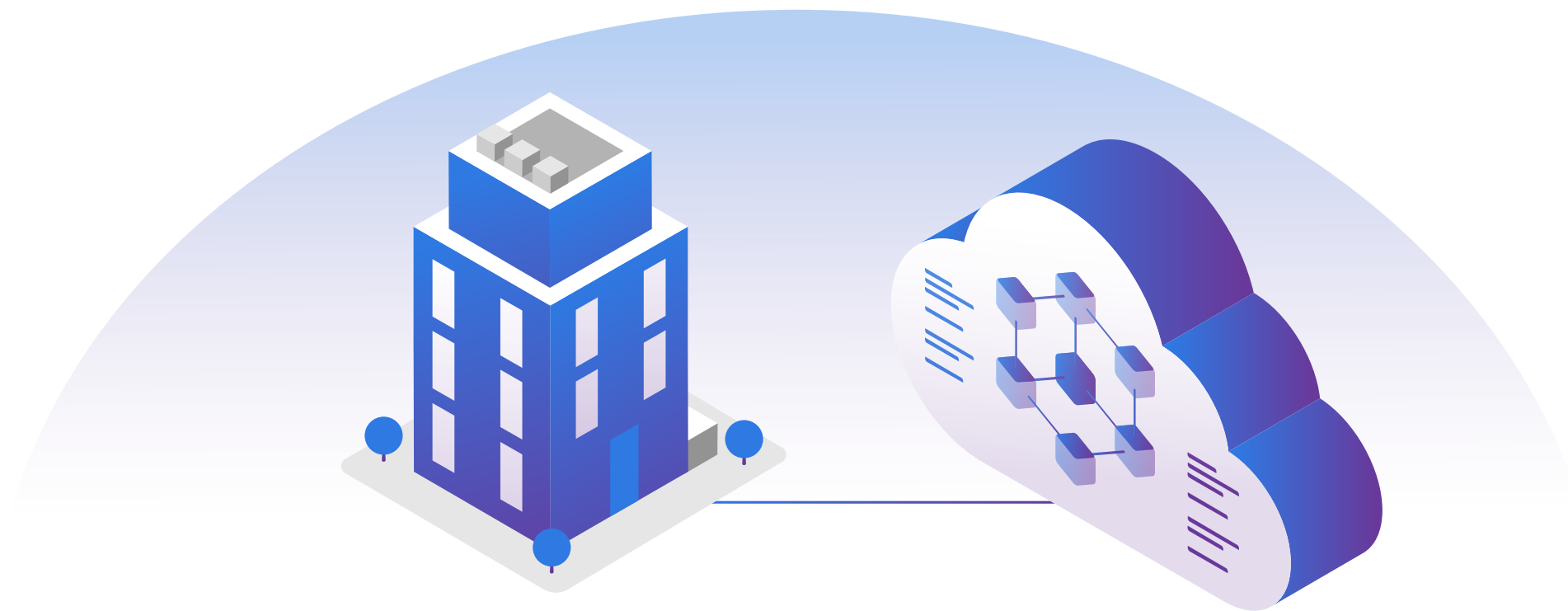


Chapter 1

Hybrid, multi-cloud is the norm

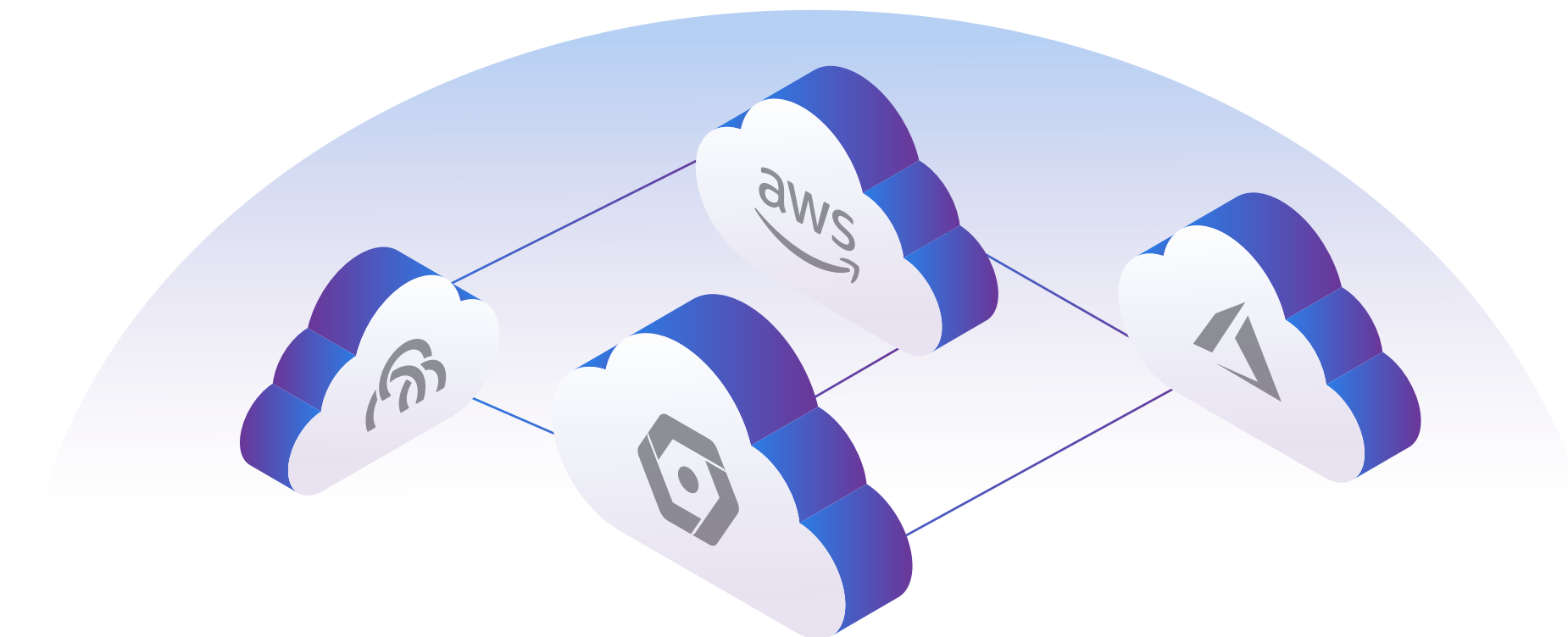
Insight

Enterprises are rapidly adopting cloud infrastructure as a service (IaaS), platform as a service (PaaS), and function as a service (FaaS) to increase agility and accelerate innovation. Cloud adoption is so widespread that hybrid multi-cloud is now the norm. According to RightScale, 81% of enterprises are executing a multi-cloud strategy, while 451 Research predicts that over two-thirds of enterprises will operate a hybrid multi-cloud environment by 2019.²



Hybrid cloud

As enterprises migrate applications to the cloud or build new cloud native applications, they are also maintaining traditional applications and infrastructure. Over time, the balance will shift from the traditional tech stack to the new stack, but new and old will continue to coexist and interact.



Multi-cloud

Different cloud platforms have different features and benefits, technologies, levels of abstraction, price, and geographic footprints, that make them suitable for specific services. Enterprises started with a single cloud provider but quickly embraced multiple clouds resulting in highly distributed application and infrastructure architectures.

¹RightScale: Cloud Computing Trends: 2018 State of the Cloud Survey
²451 Research Voice of the Enterprise: Cloud Transformation

69%

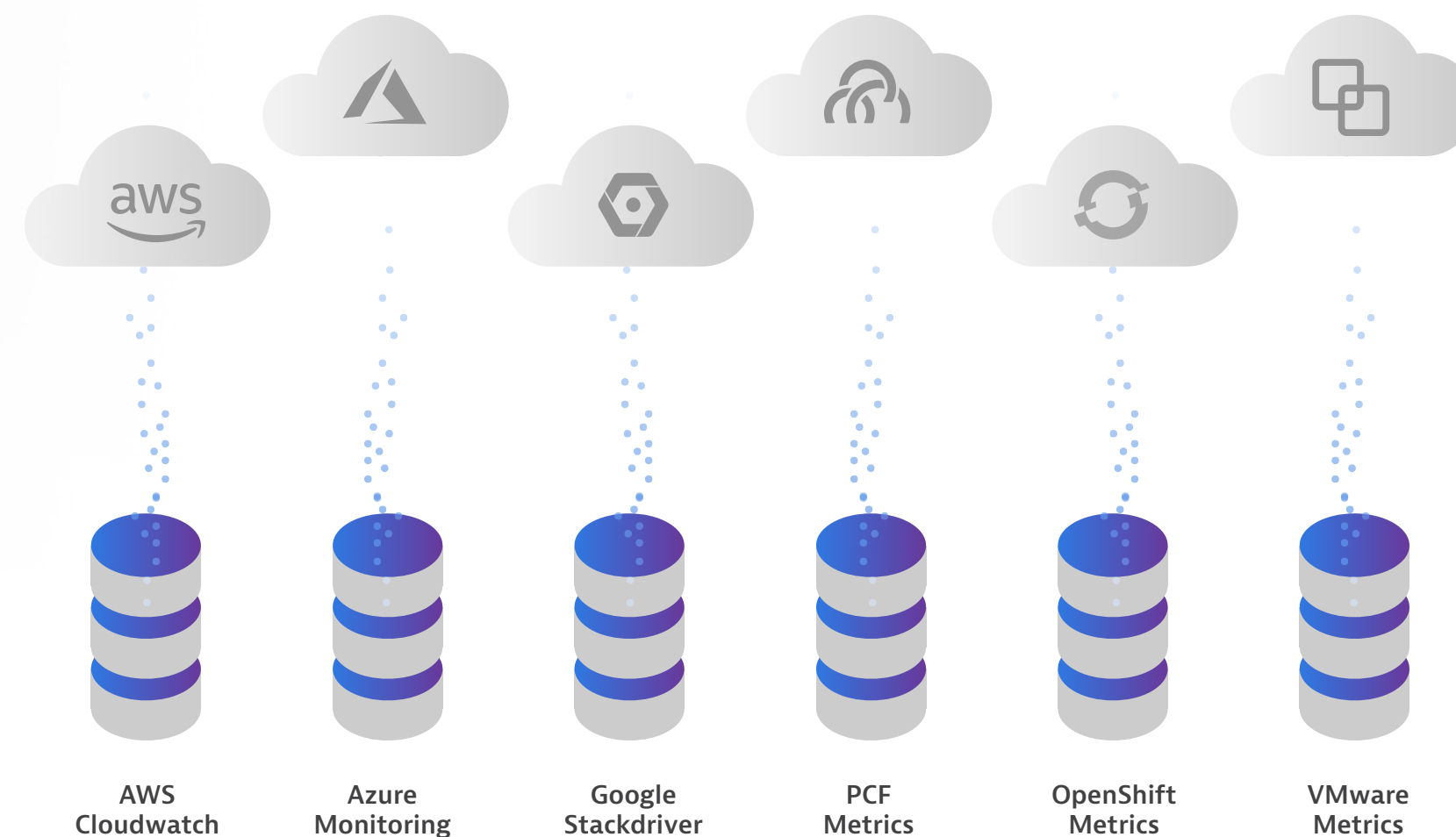
of enterprises will have a hybrid, multi-cloud environment by 2019

-451 Research

Challenge

The result of hybrid multi-cloud is bimodal IT—the practice of building and running two distinctly different application and infrastructure environments. Enterprises need to continue to enhance and maintain existing relatively static environments while also building and running new applications—scalable, dynamic software defined infrastructure in the cloud.

Putting traditional IT to one side for a moment to focus solely on multi-cloud platforms, the frequent output is monitoring-tool proliferation resulting from teams operating in siloes despite critical interdependencies between services running across clouds.



The challenge of multiple monitoring tools across clouds is further compounded when we bring traditional IT back into focus, and the need to monitor and manage a range of existing technologies that also have service interdependencies with cloud environments.

Key consideration

Simplicity and cost saving drove early cloud adoption. But today, enterprise cloud use has evolved into a complex and dynamic landscape that spans multiple clouds as well as traditional on-premises technologies. The ability to seamlessly monitor the full technology stack across multiple clouds while also monitoring traditional on-premises technology stacks is critical to automating operations, no matter how highly distributed the applications and infrastructure being monitored.



Chapter 2

Microservices and containers introduce speed

Insight

Microservices and containers are revolutionizing the way applications are built and deployed, providing tremendous benefits in terms of speed, agility, and scale.³ In fact, 98% of enterprise development teams expect microservices to become their default architecture, and IDC predicts that by 2022, 90% of all apps will feature a microservices architecture.⁴

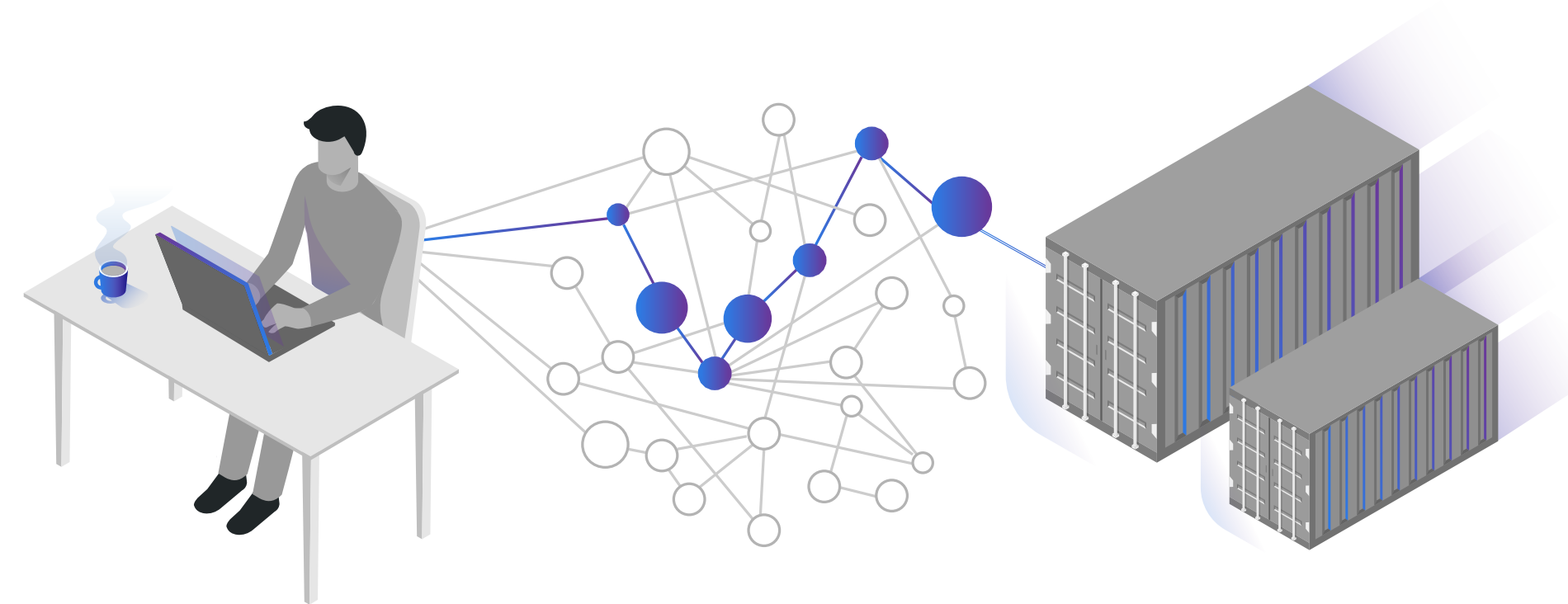
Challenge

Seventy-two percent of CIOs say that monitoring containerized microservices in real time is almost impossible. Moving to microservices running in containers makes it harder to get visibility into environments. Each container acts like a tiny server, multiplying the number of points you need to monitor. They live, scale, and die based on health and demand. As enterprises scales their Azure environments from on-premises to cloud to multi-cloud, the number of dependencies and data generated increases exponentially, making it impossible to understand the system as a whole.

The traditional approach to instrumenting applications involves the manual deployment of multiple agents. When environments consist of thousands of containers with orchestrated scaling, manual instrumentation becomes impossible and severely limits the ability to innovate.

Key consideration

A manual approach to instrumenting, discovering, and monitoring microservices and containers will not work. For dynamic, scalable platforms like Azure, a fully automated approach to agent deployment and continuous discovery of containers and monitoring of the applications and services running within them is mandatory.



72%
of CIOs say
monitoring
containerized
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-Dynatrace CIO Complexity Report

³Dimensional Research, April 2018 report

⁴IDC FutureScape

⁵Dynatrace CIO Complexity Report

Chapter 3

Not all AI is equal

Insight

Gartner predicts 30% of IT organizations that fail to adopt AI will no longer be operationally viable by 2022.⁶ As enterprises embrace a hybrid multi-cloud environment, the sheer volume of data created and the massive environmental complexity will make it impossible for humans to monitor, comprehend, and take action. This critical need for machines to solve data volume and speed challenges has resulted in Gartner creating a new category—AIOps (AI for IT operations).

Challenge

AI is a buzzword across many industries and making sense of the market noise is difficult. To help, here are three key AI use cases to keep in mind when considering how to monitor your Azure platform and applications:

AI and root cause analysis

The biggest benefit of AI to monitoring is its ability to automate root cause analysis, which makes it possible to identify and resolve problems at speed. An AI engine that has access to more complete data (including third-party data) will provide faster, contextual insights.

AI and alert storms

AI is perfectly suited to real-time monitoring and analysis of large data sets to provide the most probable reason for a performance issue. AI recognizes when related anomalies occur within your environment (for example, when thresholds are broken), thereby preventing alert storms.

AI and autoremediation

AI should be a part of your CI/CD pipeline, deployment, and remediation processes. Problems can be detected instantly, and bad builds will be identified earlier so you can automatically remediate or roll back to a previous state.

Many enterprises are trying to address these use cases by adding an AIOps solution to the 10 to 25+ monitoring tools they already have. While this approach may have limited benefits, such as alert noise reduction, it will have minimal effectiveness addressing the root cause analysis and autoremediation use cases as it lacks contextual understanding of the data to draw meaningful conclusions.

⁶AI (in a box) for IT Ops—The AIOps 101 you've been looking for

You will also find there are many different approaches to AI. Here are a few of the more popular ones you are likely to encounter as you move towards an AIOps strategy:

Deterministic AI ★★★★★

This gives you the ability to discover the topology of your environment and the metrics produced by all components. It works immediately and adapts to changes without having to relearn patterns. It is also excellent at event noise reduction (alert storms), dependency detection, root cause analysis, and business impact analysis.

Machine-learning AI ★★

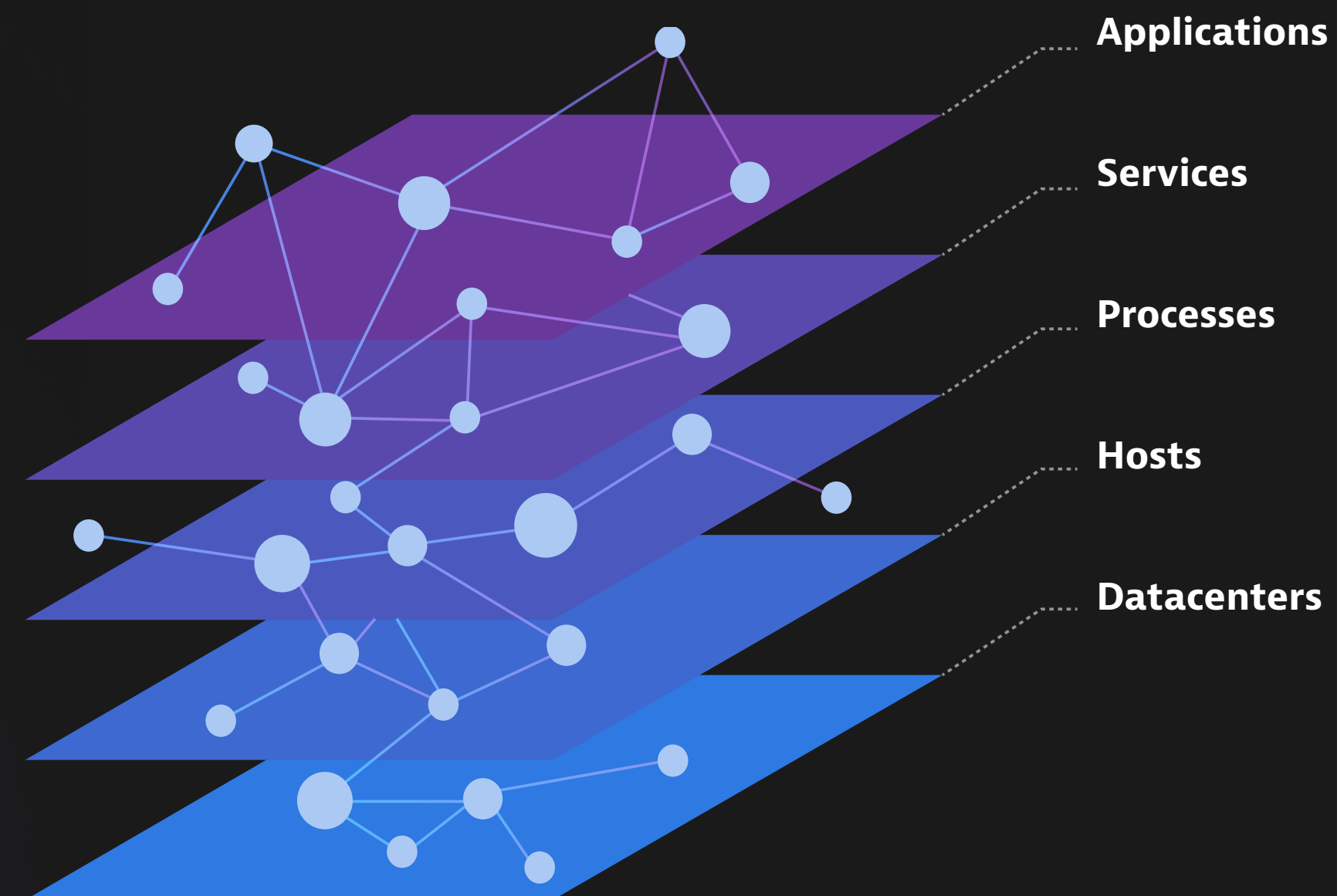
This is a metrics-based approach. It takes time to build a data set to which it can compare previous states. Its strongest feature is limiting event noise reduction. However, it does not offer root cause or business impact analysis.

Anomaly-based AI ★

This form of AI provides satisfactory event noise reduction and dependency detection. One of the major drawbacks is that it takes a lot of time to build a metrics model that would show a correlation for root cause analysis.

Key consideration

Not all AI is created equal. Attempting to enhance existing monitoring tools with AI such as machine learning and anomaly-based AI, will provide limited value. AI needs to be inherent in all aspects of the monitoring platform and see everything in real time, including the topology of the architecture, dependencies, and service flow. AI should also be able to ingest additional data sources for inclusion in the AI algorithms, as opposed to correlating data via charts and graphs.



30%

of IT organizations that fail to adopt AI will no longer be operationally viable by 2022

-Gartner

Chapter 4

DevOps: Innovation's soulmate

Insight

DevOps is perhaps the most critical consideration when maximizing investment in Azure and other cloud technologies. Implemented and executed correctly, DevOps enhances an enterprise's ability to innovate with speed, scale, and agility. Research shows that high performing DevOps team have 46 times more frequent code deployments and 440 times faster lead time from commit to deploy.⁷

Challenge

As enterprises scale DevOps across multiple teams, there will be hundreds or thousands of changes a day, resulting in code pushes every few minutes. While CI/CD tooling helps mitigate error-prone manual tasks through automated build, test, and deployment, bad code can still make it into production. The complexity of a highly-dynamic and distributed cloud environment like Azure, along with thousands of deployments a day, will only exacerbate this risk.

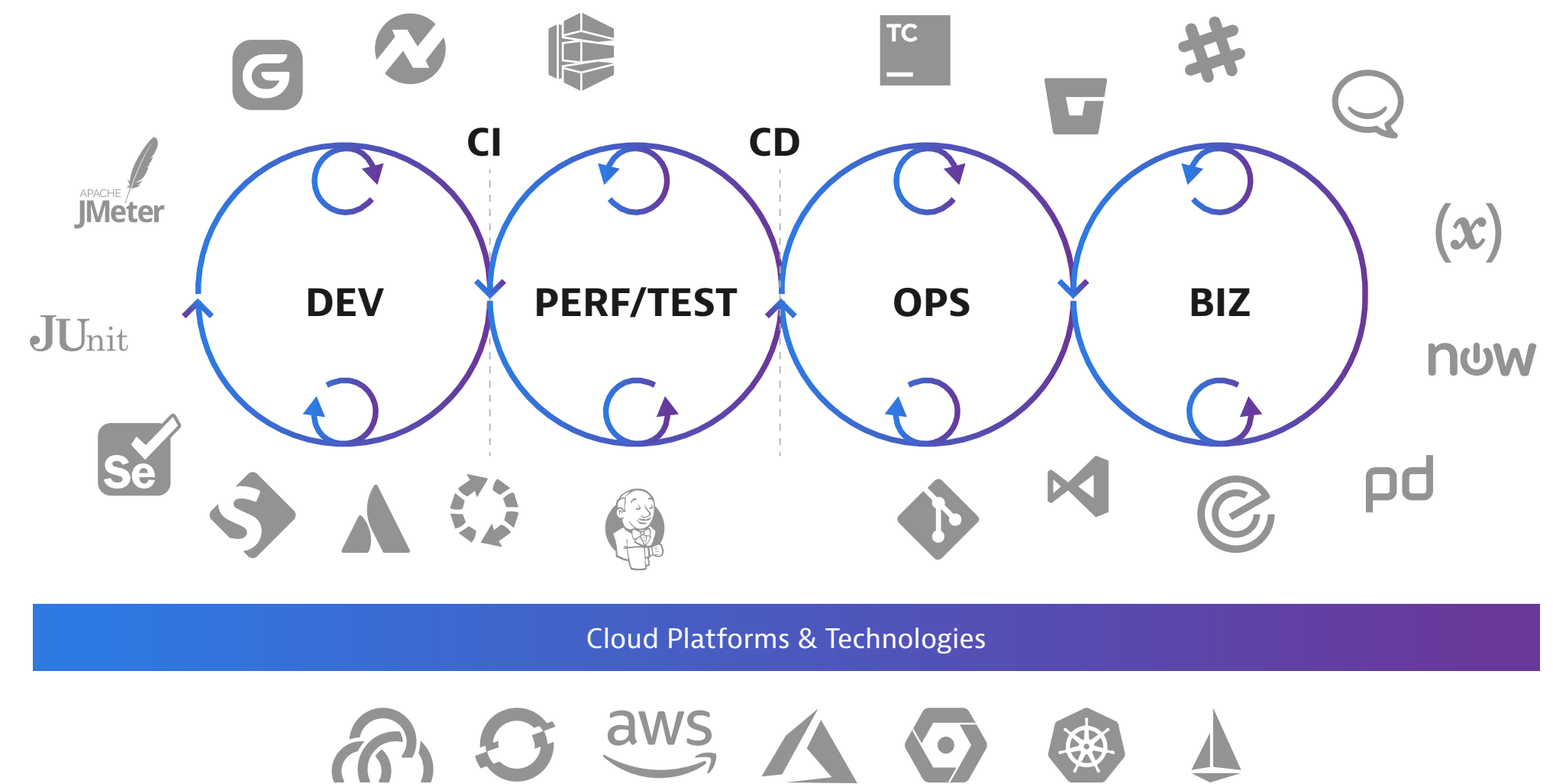
As the software stakes get higher, shifting performance checks left—that is, earlier in the pipeline—enabling faster feedback loops becomes critical. But it can't be accomplished easily with a multi-tool approach to monitoring. To be effective, a monitoring solution needs to have a holistic view of every component, every change, and contextual understanding of the impact each change has on the system as a whole.

⁷DevOps Research and Assessment: 2018 State of DevOps

Key consideration

To go fast and not break things, automatic performance checks need to happen earlier in the pipeline. To achieve this, a monitoring solution should have tight integration with a wide range of DevOps tooling. And combined with the right AI, these integrations will also help support the move to AIOps and enable automated remediation to limit the impact of bad software releases.

Check to see which DevOps tooling a particular monitoring solution integrates with and supports, and consider how it will impact your ability to automate things in the future.



Chapter 5

Digital experiences matter

Insight

Enterprises are striving to accelerate innovation without putting customer experiences at risk, but it's not just traditional end-customer experiences of web and mobile apps at risk. Apps built on Azure support a broad range of services and audiences:

- **The consumerization of IT has evolved to include wearables, smart homes, smart cars and life-critical health devices**
- **Corporate employees are increasingly working remotely and need access to systems that are in the corporate datacenter and cloud based**
- **Employees using office workspaces rely on smart office features for lighting, temperature, safety, and security, which are reliant on the emerging paradigm of machine-to-machine (M2M) communications (Internet of Things)**

The rise of the machines

Machines are used in unimaginable areas worldwide and are increasingly being hooked into the Internet, across all industries, creating a colossal communication network at the global scale. Gartner estimates connected devices in use worldwide will top 20 billion by 2020.

What was simply regarded as user experience has evolved and grown into digital experience, encapsulating end-users, employees, and IoT.



76%

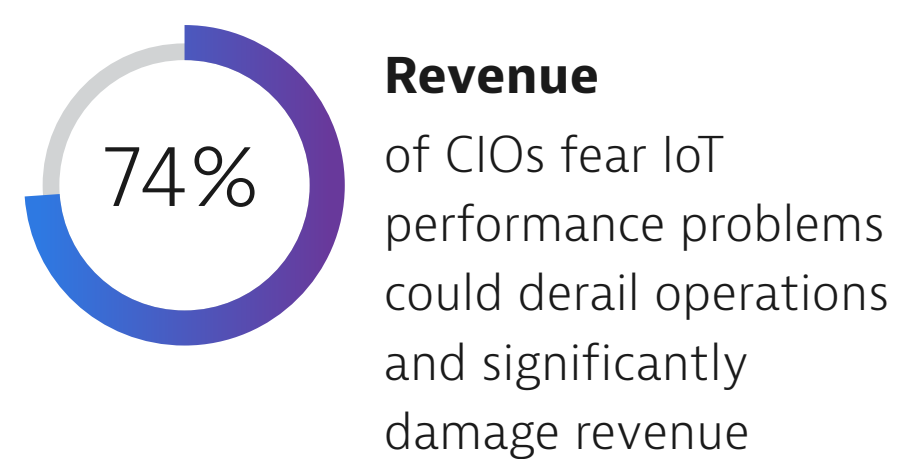
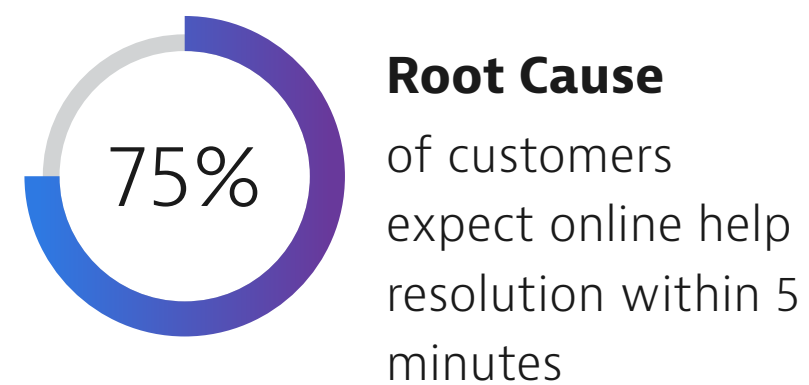
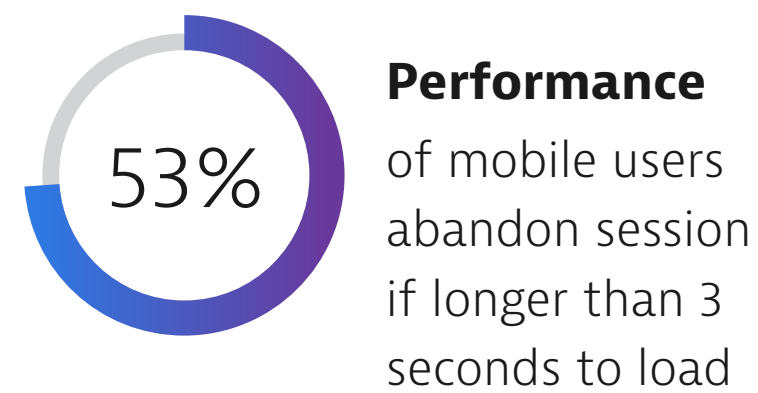
of CIOs say multi-cloud deployments make monitoring user experience difficult

-Dynatrace CIO Complexity Report

Challenge

Enterprise IT departments face mounting pressure to accelerate their speed of innovation, while user expectations for speed, usability, and availability of applications and services increases unabated. Combined with the explosion of IoT devices and the increasingly vast array of technologies involved, managing and optimizing digital experiences while embracing high frequency software release cycles and operating complex hybrid cloud environments presents significant challenges.

If digital experiences aren't measured, how can enterprises prioritize and react when problems occur? Are they even aware there are problems? And if experiences are quantified, is it in the context of the supporting applications, services, and infrastructure that permit rapid root-cause analysis and remediation? Only enterprises able to deliver extraordinary digital customer experiences will stay relevant and prosper.



*stats from global complexity report

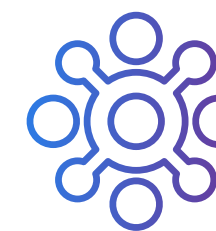
Key consideration

Enterprises need confidence that they're delivering, or on the path to delivering, exceptional digital experiences in increasingly complex environments. To achieve this, they require real-time monitoring and 100% visibility across all types of customers, employees, and machine-based experiences. Key things to look for include:



Ability to visualize and prioritize impact

Understand how specific issues or overall performance impacts every single user session or device and prioritize by magnitude.



Visibility from the edge to the core

A single view across your entire multi-cloud ecosystem. From the performance of users and edge devices to your applications and cloud platforms, all in context.



Single source of truth for all

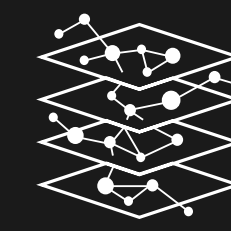
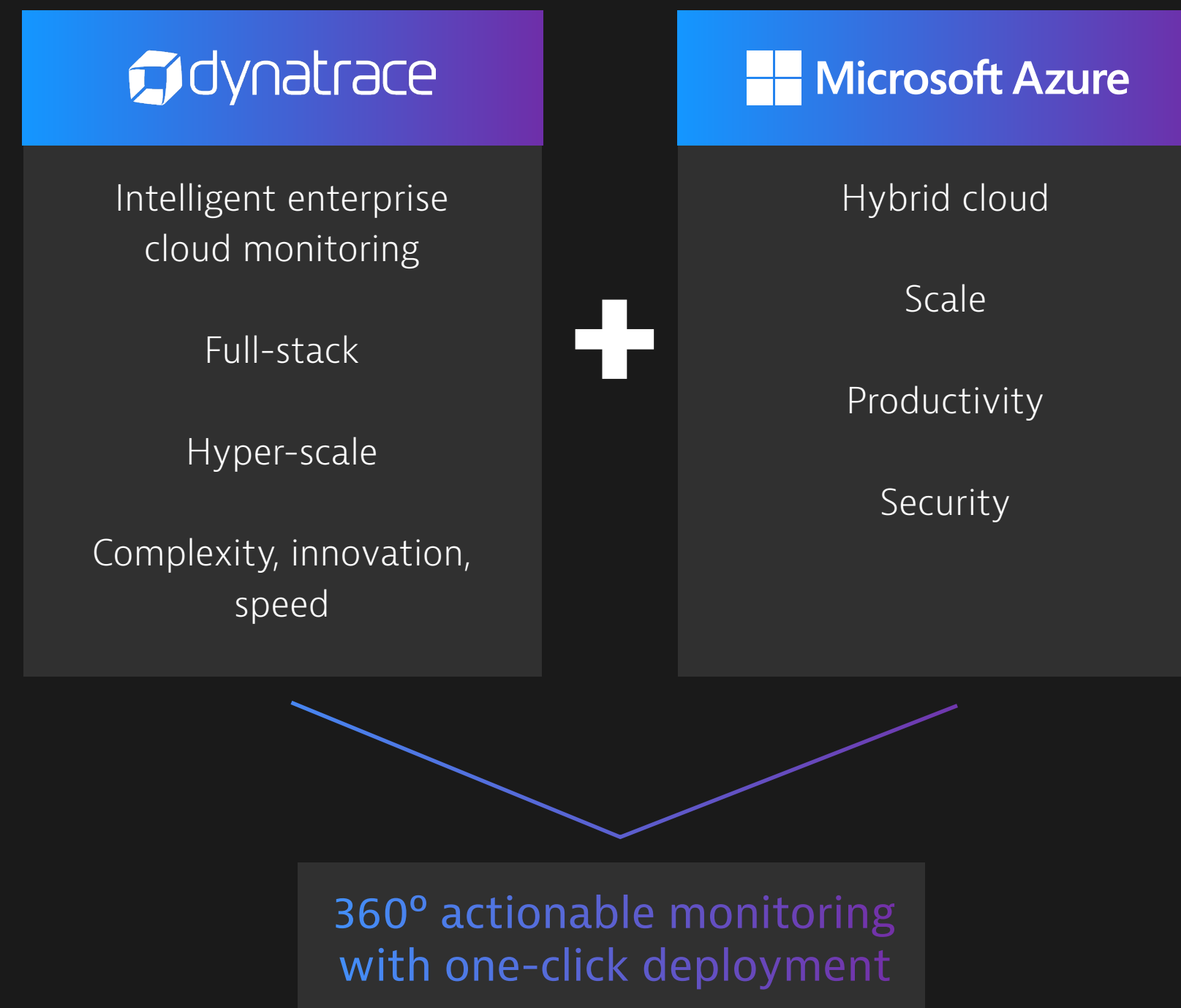
Ensure stakeholders, from IT to marketing, have access to the same data to avoid silos, finger pointing, and war rooms.

Dynatrace helps you build and run perfect software

Our all-in-one platform provides intelligence into the performance of your apps, underlying infrastructure, experience of users, and more, so you can automate IT operations, release better software faster, and deliver unrivaled digital experiences.

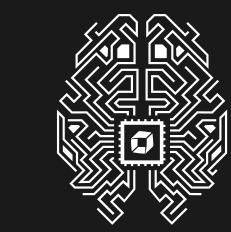
Dynatrace is an all-in-one enterprise cloud monitoring solution that provides real-time answers and insights for all teams. AI-powered, full stack, and completely automated — all you need to transform faster and compete more effectively in the digital age.

Dynatrace + Microsoft Azure: A powerful partnership



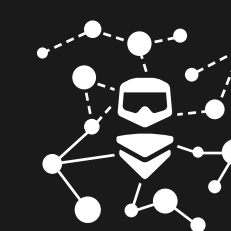
Full Stack

Understand all the relationships and interdependencies, top to bottom, for your complex enterprise cloud ecosystem.



AI Powered

Deterministic, causation-based AI for real-time insights, actions, and actionable answers, not just more data.



Automated

Zero-touch configuration, continuous discovery and mapping, effortless problem identification, and root cause determination.

Spend your time innovating, not monitoring

Leveraging Dynatrace enables enterprises to innovate faster, automate IT operations, and provide perfect software experiences to customers. Dynatrace is built to support innovation at scale, minimize risk, and reduce cloud complexity. Utilizing its AI capabilities, Dynatrace provides real-time, high-fidelity data to operations, development, and business teams.

This helps organizations lay the foundation for a more collaborative organizational structure. It opens the door to even greater agility and flexibility to innovate at scale through automation and autonomous cloud operations.

- **AI-powered, answer-centric insights:** Dynatrace's Smartscape data model integrates to understand interconnections and interdependencies, yielding causation, not just correlation, and providing continuous and deterministic answers and insights
- **Single-agent, fully automated platform:** Self-learning management and optimization of all applications requires fewer resources and dramatically reduces total cost of ownership.
- **Full-stack, all-in-one approach with deep cloud integration:** Providing extensive integration across multi-cloud and dynamic microservices environments, leveraging OpenAPI Initiative to provide incremental context.
- **Web-scale and enterprise grade:** Dynatrace is built cloud-native to be highly scalable, available, and secure. Based on robust enterprise-proven cloud technologies, it scales to 100,000+ hosts easily.
- **Flexible deployment options:** Dynatrace provides a pure SaaS solution as well as a managed on-premises offering, combining the simplicity, software currency, and scalability of SaaS with the choice of keeping data on-premises.

Dynatrace by the numbers

1

solution for all performance management across on-premises, cloud, hybrid, and multi-cloud environments.

0

configuration required.

600+

R&D experts ensure the industry's broadest technology coverage.

100,000+

hosts: Scales for the world's largest environments.

5

minutes: Start monitoring in just minutes with a software-as-a-service, managed, or on-premises solution.

360°

monitoring.

1

-click deployment.

The bottom line:

Transform your digital business faster with software intelligence

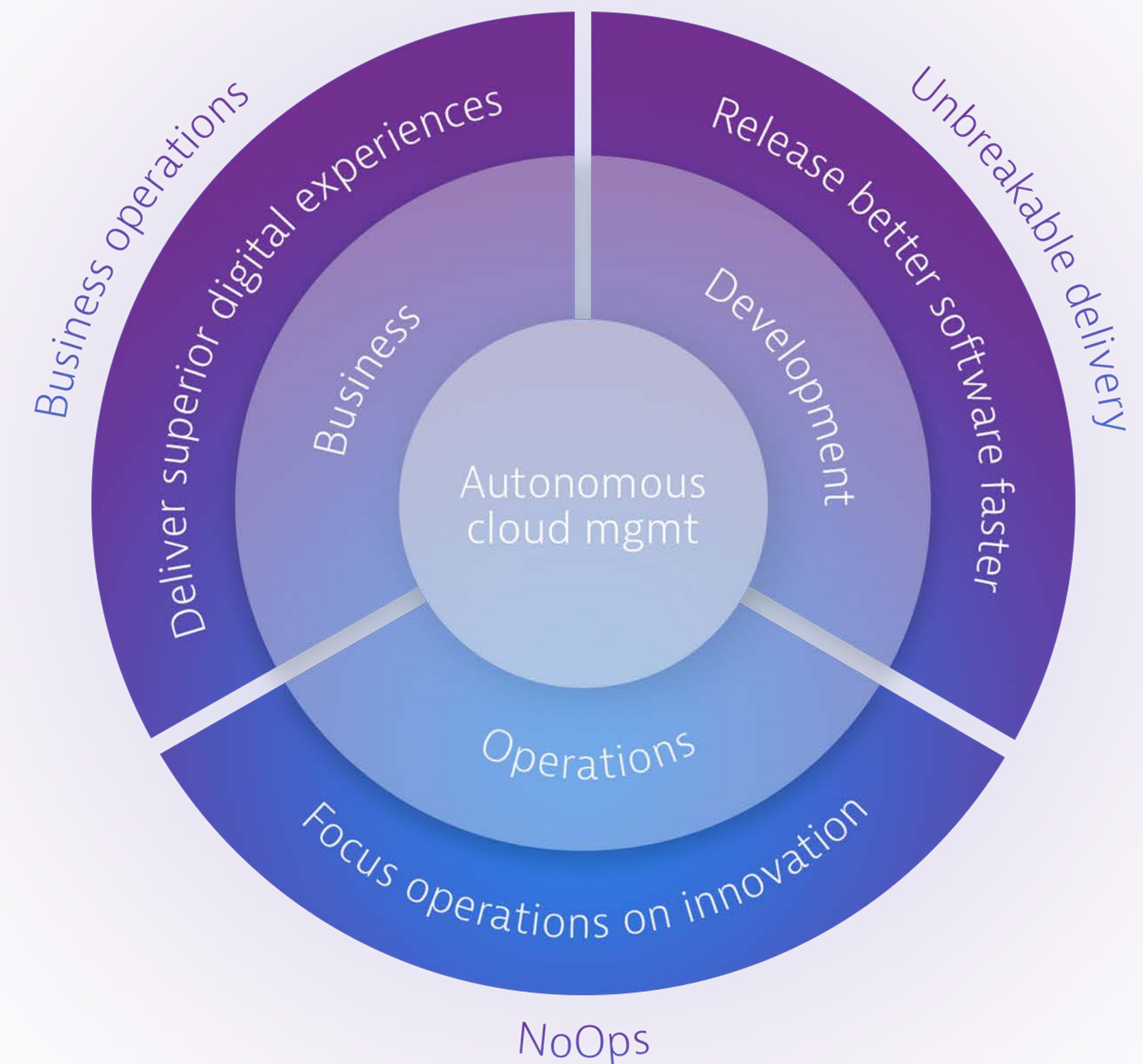
With Dynatrace and Microsoft Azure, organizations can:

- **Release better software, faster.** Build an unbreakable delivery pipeline and enable self-healing, so you can focus on innovation, not troubleshooting.
- **Automate and modernize cloud operations.** Ensure enterprise cloud success while optimizing resources and rationalizing tools with automated, AI-powered monitoring.
- **Deliver perfect software experiences.** Ensure perfect experiences by seeing every customer's journey from their perspective, in the context of your app and infrastructure performance.

Power and scale: Native Microsoft Azure integration

Dynatrace natively embeds OneAgent technology through Azure virtual machine extensions, making it the most powerful enterprise cloud monitoring solution available for Azure.

One-click deployment via the Azure portal or Azure's Management REST API delivers the full picture of how Dynatrace builds on top of the productivity, intelligence, and hybrid capabilities of Azure. Mutual customers are supported with enhanced container and application performance monitoring across their organization.



Enterprises use Microsoft Azure

to fundamentally transform how they build and run applications at speed and scale in highly distributed, multi-cloud environments.

We hope this *5 Key Considerations for Monitoring Microsoft Azure* e-book has provided helpful advice and guidance to you on your Azure journey. Dynatrace is committed to providing enterprises the data and intelligence they need to be successful with their Azure deployments, no matter how complex.

Learn more

If you are ready to learn more, please **visit www.dynatrace.com/trial** for assets, resources, and a **free 15-day trial**.



About Dynatrace

Dynatrace provides software intelligence to simplify enterprise cloud complexity and accelerate digital transformation. With AI and complete automation, our all-in-one platform provides answers, not just data, about the performance of applications, the underlying infrastructure, and the experience of all users. That's why many of the world's largest enterprises, including 72 of the Fortune 100, trust Dynatrace to modernize and automate enterprise cloud operations, release better software faster, and deliver unrivaled digital experiences.