

# Azure DevOps

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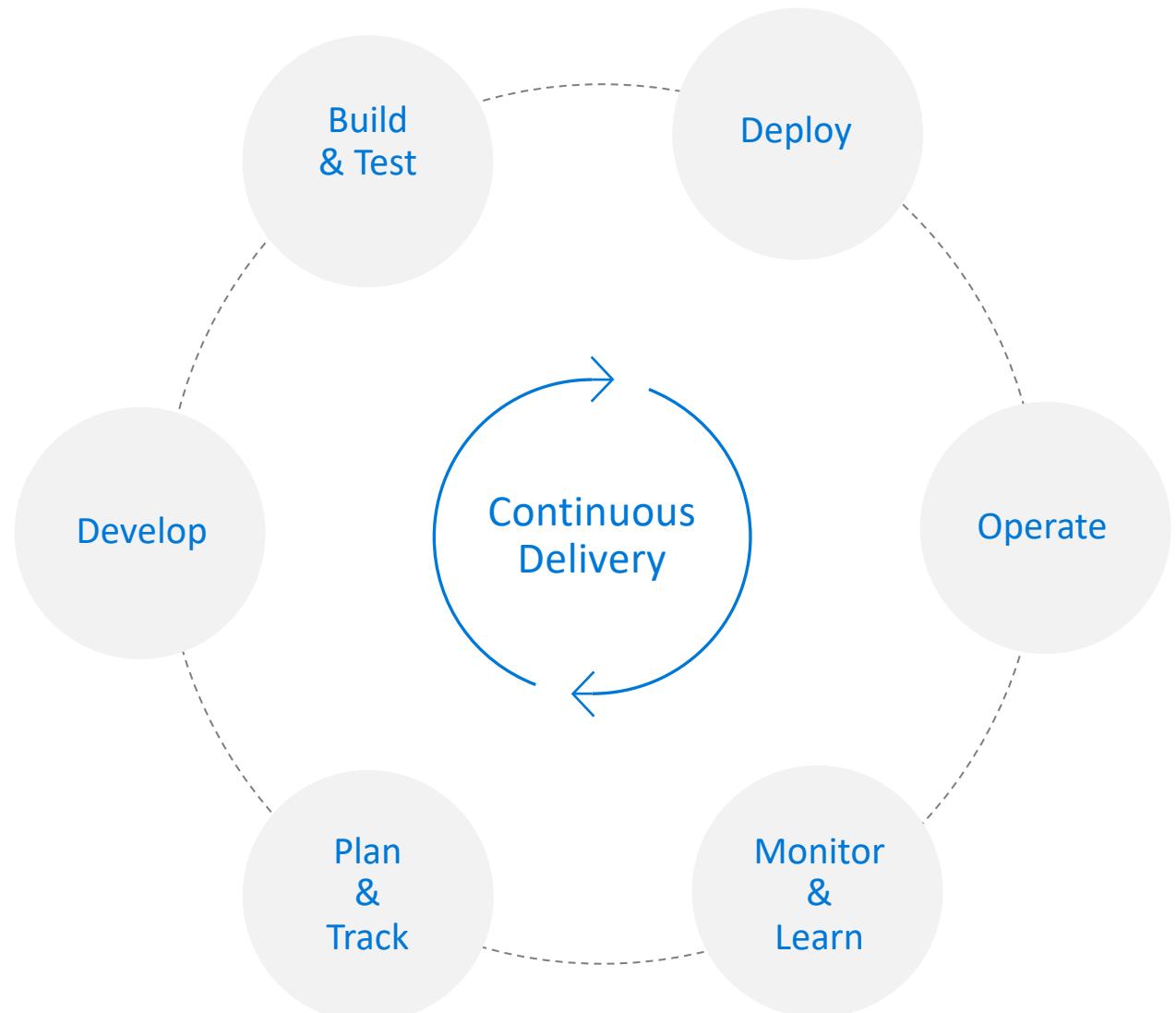
# What is DevOps?

People. Process. Products.

“

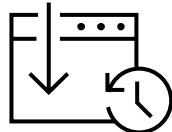
DevOps  
是人员、流程和产品的结合，能  
够持续向最终用户交付价值。

”



# 我需要哪些技术来支持 DevOps ?

DevOps 将人员、流程和技术汇集在一起，实现软件交付自动化，为您的用户提供持续的价值。使用 Azure DevOps，您可以更快、更可靠地交付软件 - 无论您的 IT 部门有多大，或者使用什么工具。



## Continuous Integration (CI)

- 提高软件开发质量和速度。
- 当您使用 Azure 管道或 Jenkins 在云中构建应用并部署到 Azure 时，每次提交代码时，都会自动生成和测试代码，并更快地检测到 Bug。
- 

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## Continuous Deployment (CD)

- 通过将持续集成和基础结构作为代码 (IaC) 相结合，您将实现相同的部署和信心，随时部署到生产中。
- 通过连续部署，如果 CI/CD 测试成功，您可以自动执行从代码提交到生产的整个过程。
- 



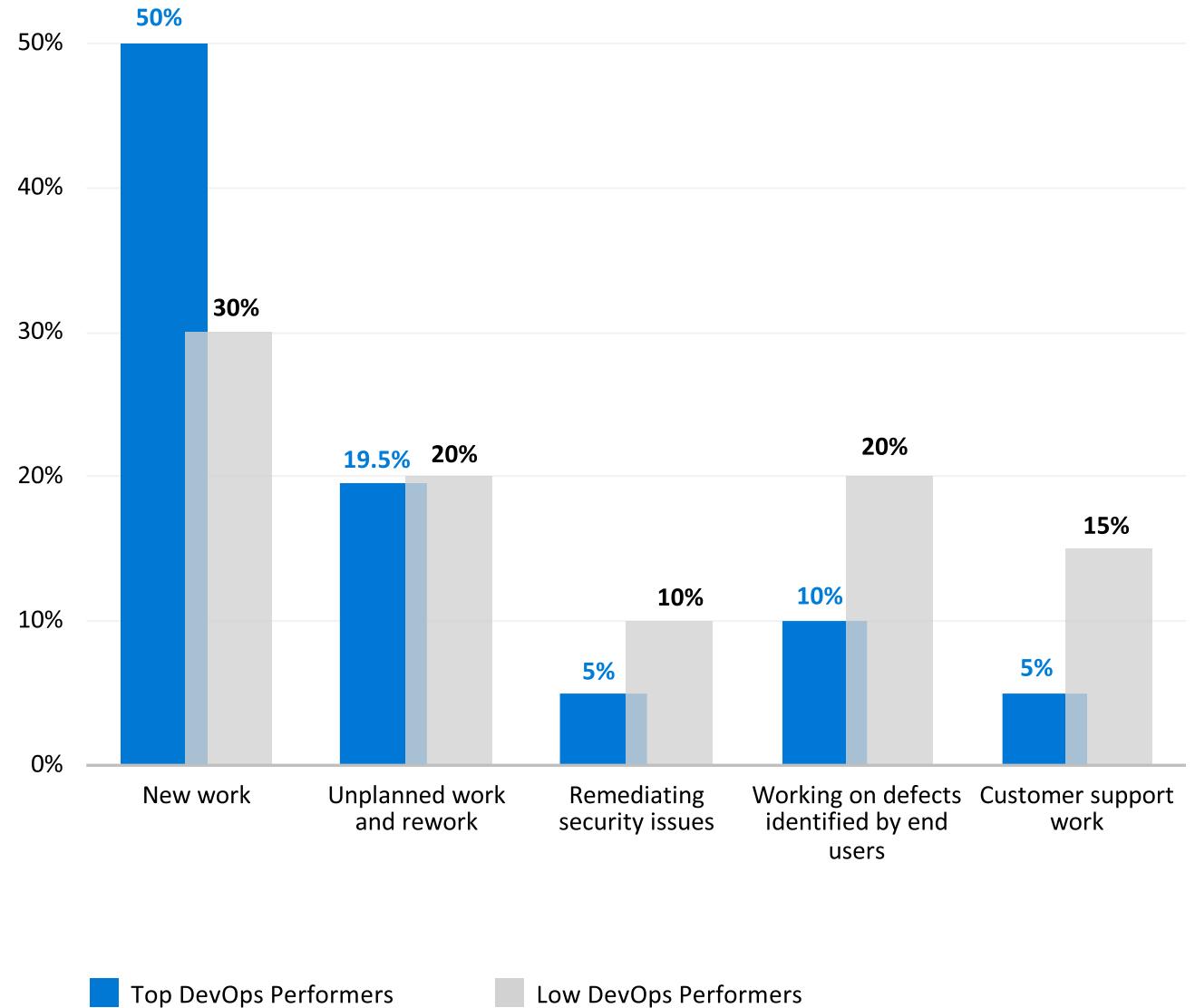
## Continuous Learning & Monitoring

- 使用 Azure 应用程序见解，您可以确定应用程序的性能，并测试最近的部署是使情况变得更好还是更糟。
- 使用 CI/CD 实践，结合监控工具，您将能够在客户准备就绪后立即安全地将功能交付给客户。
-

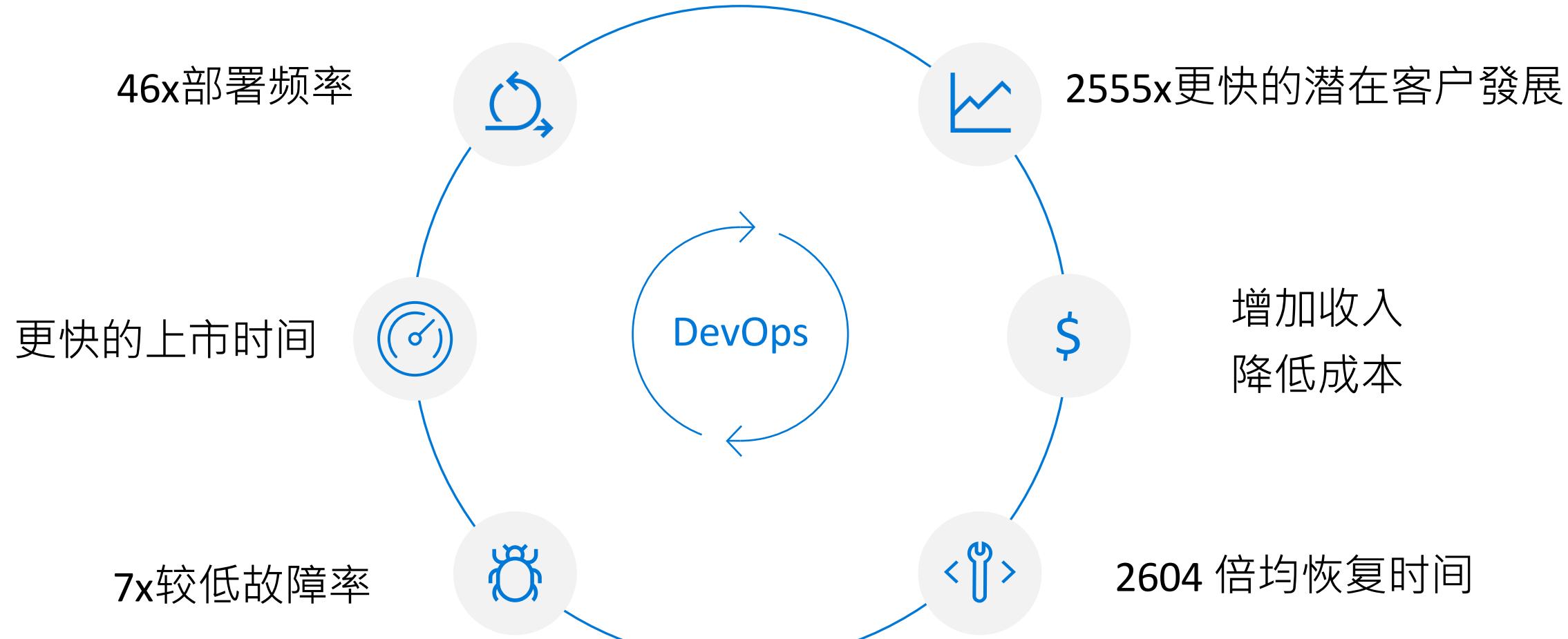
# Innovation with control

Top performing DevOps companies  
spend more time innovating and less  
time “keeping the lights on”

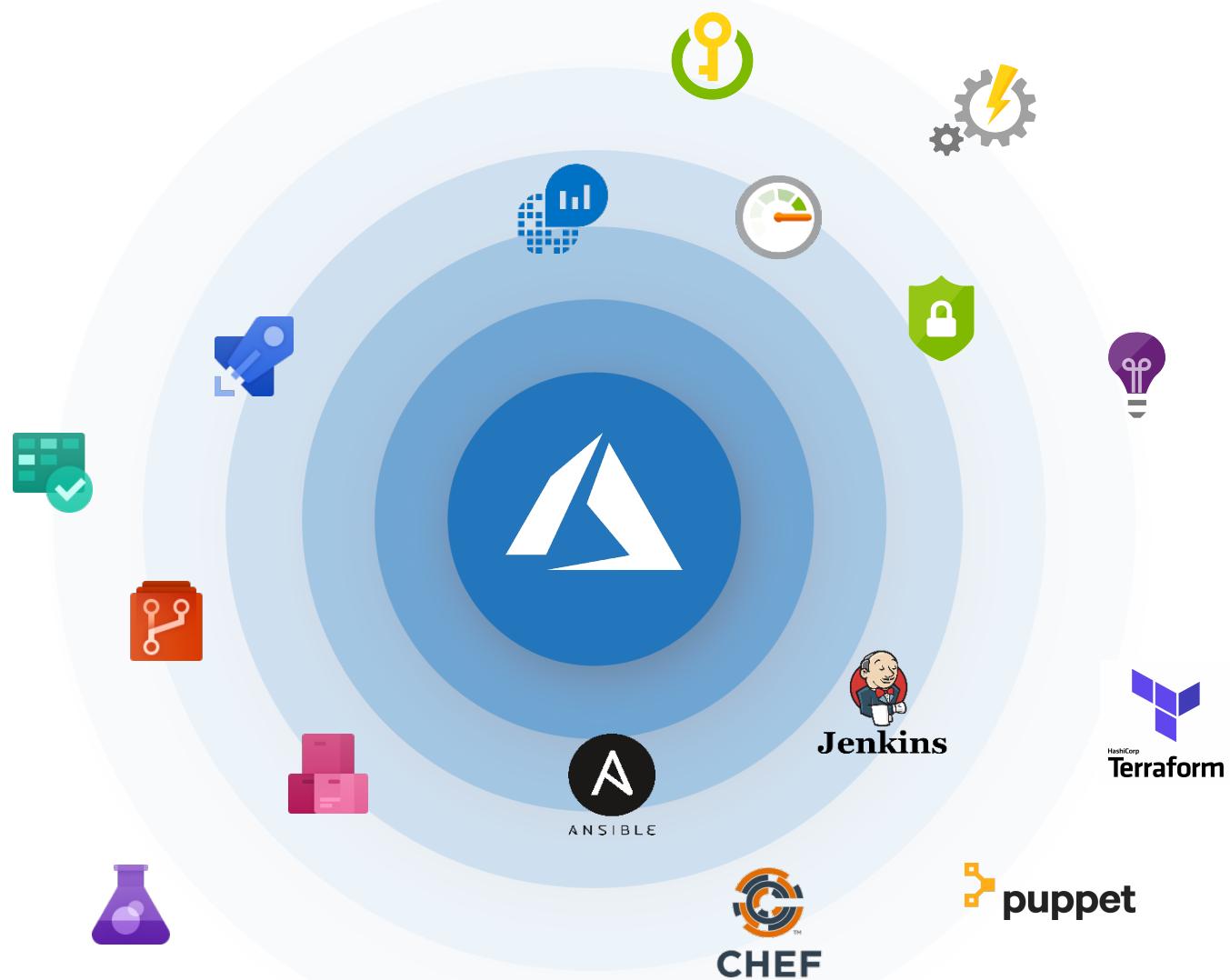
Time spent

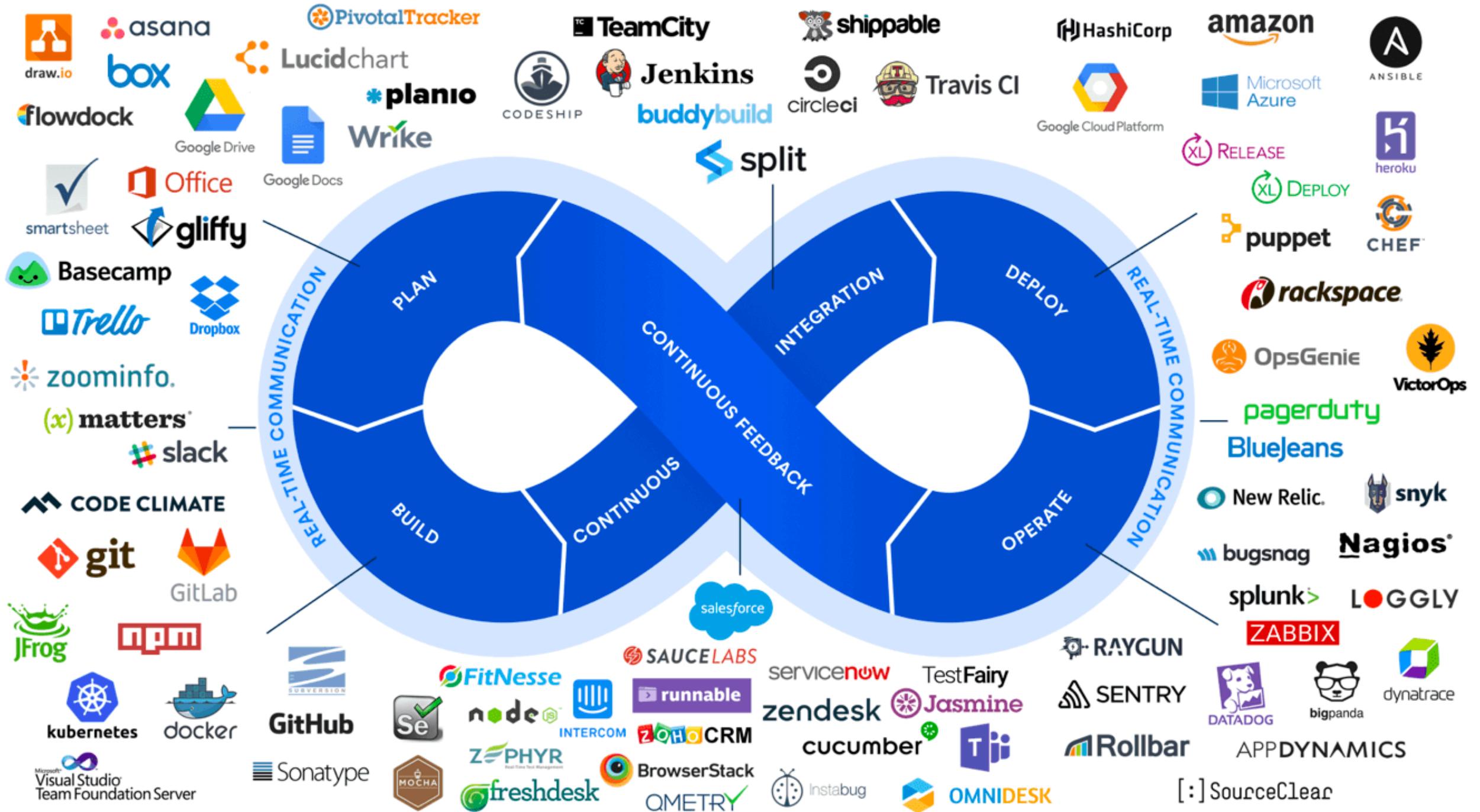


# High Performance DevOps Companies Achieve...



# Broadening the Azure Ecosystem





# Azure DevOps



Azure Boards



Azure Repos



Azure Pipelines



Azure Test Plans



Azure Artifacts



Plan smarter, collaborate better, and ship faster with a set of modern dev services



Any developer, any platform, any cloud. Full support for hybrid cloud, on-premises & containers.



Use all the Azure DevOps services or choose just what you need to complement your existing workflows



Best in class builds for open source. Free unlimited build minutes for public projects and up to 10 free concurrent jobs across Windows, Linux and macOS



Get started for free for small teams, scales to support the largest enterprises

Start free today



<https://azure.com/devops>

# Introducing Azure DevOps



## Azure Boards

使用敏捷工具更快地为用户交付价值，以规划、跟踪和讨论整个团队的工作。



## Azure Pipelines

使用适用于任何语言、平台和云的 CI/CD 构建、测试和部署。连接到 GitHub 或任何其他 Git 提供程序并持续部署。



## Azure Repos

无限、云托管的私有 Git 存储库，并协作使用拉取请求和高级文件管理构建更好的代码。



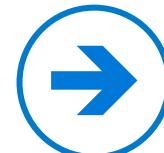
## Azure Test Plans

使用手动和探索性测试工具进行测试和打包。



## Azure Artifacts

创建、托管和共享包，可向 CI/CD 管道添加项目。



<https://azure.com/devops>

# Azure Pipelines

云托管流水线管道提供多种跨平台以及开源支持



## Any language, any platform, any cloud

构建、测试和部署 Node.js、Python、Java、PHP、Ruby、C/C++、.NET、Android 和 iOS 应用。在 Linux、macOS 和 Windows 上并行运行。部署到 Azure、AWS、GCP 或本地



## Extensible

提供并实施各种社区构建的构建、测试和部署任务，以及从 Slack 到声纳云的数百个扩展。支持 YAML、报告等



## Containers and Kubernetes

轻松生成映像并将其推送到容器注册表，如 Docker Hub 和 Azure 容器注册表。将容器部署到单个主机或 Kubernetes。



## Best-in-class for open source

确保每个开源项目的快速持续集成/持续交付（CI/CD）管道。为所有开源项目获取无限制的构建分钟数，跨 Linux、macOS 和 Windows 提供多达 10 个免费并行作业

The screenshot shows the Azure DevOps Pipelines interface for the AdventureWorks Mobile project. The left sidebar includes links for AdventureWorks, Overview, Pipelines (selected), Builds, Releases, Library, and Deployment groups. The main area displays a summary of three parallel jobs: Windows Job (Running, 1m 53s), Linux Job (Running, 3m 29s), and macOS Job (Running, 3m 07s). A detailed view of the Linux Job is shown on the right, listing steps: Prepare job, Initialize job, Get sources, Cmdline, Nodetool, and Install dependencies. The terminal output shows the execution of commands like yarn install, node build/npm/preinstall.js, and npm run compile.

```
yarn install v1.7.0
$ node build/npm/preinstall.js
[1/4] Resolving packages...
[2/4] Fetching packages...
[3/4] Linking dependencies...
[4/4] Building fresh packages...
$ npm run compile
> code-oss-dev-build@1.0.0 compile ./adventureworks/build
> tsc -p tsconfig.build.json

+ Done in 4.89s.
$ node ./postinstall
[##] 2/2 removed './adventureworks/extensions/node_modules/typescript/lib/tsc.js'
removed './adventureworks/extensions/node_modules/typescript/lib/tsserverlibrary.d.ts'
removed './adventureworks/extensions/node_modules/typescript/lib/tsserverlibrary.js'
removed './adventureworks/extensions/node_modules/typescript/lib/typescriptServices.d.ts'
removed './adventureworks/extensions/node_modules/typescript/lib/typescriptServices.js'
```



<https://azure.com/pipelines>



## 与 GitHub 集成

Azure Pipelines available now to  
any developer from the GitHub  
Marketplace

The screenshot shows the GitHub Marketplace page for Azure Pipelines. At the top, there's a search bar and navigation links for Pull requests, Issues, Marketplace, and Explore. Below the header, the page title is "Marketplace / Azure Pipelines". A large circular icon contains the Azure Pipelines logo (a blue gear with a white lightning bolt). To the right of the icon, there are two buttons: "Set up a new plan" (green) and "Edit your plan ▾" (grey). The main content area has a heading "Azure Pipelines" and a sub-heading "Continuously build, test, and deploy to any platform and cloud". It mentions that Azure Pipelines offers cloud-hosted pipelines for Linux, macOS, and Windows with 10 free parallel jobs and unlimited minutes for open source projects. There's also a "Read more..." link. On the left side of the main content, there are sections for "Categories" (Continuous integration, Deployment), "Supported languages" (Dockerfile, Go, Java, and 7 other languages supported), and "Developer links" (Support, Status, Documentation, Privacy Policy). The bottom half of the page features a large blue banner with the text "Linux, macOS, and Windows agents" and a description: "Simplify managing hardware and VMs by using Microsoft cloud-hosted agents. Get full CI/CD pipeline support for every major platform and tool." Below the banner, there's a diagram showing a sequence of pipeline steps: "Test 27 succeeded" (green checkmark), "Build Linux 6 succeeded" (green checkmark), "Build Windows 2 succeeded" (green checkmark), "Build macOS 64% in progress..." (blue circle), and "Distribute" (grey outline).

# Azure Boards

使用看板、积压工作、团队仪表板和报表跟踪工作



## Connected from idea to release

在每个开发阶段跟踪您的所有想法，并保持您的团队与直接链接到工作项的所有代码更改保持一致。



## Scrum ready

使用内置的 Scrum 板和规划工具，帮助您的团队运行冲刺（sprint）、站立和规划会议。



## Project insights

借助强大的分析工具和仪表板小部件，获得对项目运行状况和状态的新见解。



<https://azure.com/devops>

The screenshot shows the Azure DevOps Boards interface for the 'FabrikamFiber' project. The left sidebar includes links for 'Overview', 'Boards' (which is selected), 'Work Items', 'Backlogs', 'Sprints', 'Queries', 'Plans', 'Repos', 'Pipelines', 'Test Plans', and 'Artifacts'. The main area is titled 'FabrikamFiber Board' and displays a Kanban board with columns for 'New', 'Active', '5/5 Staging', and '15/5 Deployed'. The 'New' column contains a 'New item' section with cards for 'Hotels filter page' (by Carlos Slattery, Spike, Xamarin) and 'Guests page' (by Carole Poland, ML, Xamarin). The 'Active' column contains cards for 'Home page (selected room)' (by Kat Larson, Design), 'Top page controls' (by Celeste Burton, ML, Xamarin), 'Entry + validations' (by Carole Poland, ML, Xamarin), 'Navigation menu' (by Carlos Slattery, AI, Xamarin), 'Login page' (by Celeste Burton, Blocked, Xamarin), 'Ambient settings' (by Carlos Slattery, Xamarin), and 'Notifications list' (by Carole Poland, General). Other cards visible include 'NFC open door' (by Cecil Folk, Spike, Xamarin), 'Room Tab' (by Celeste Burton, Rooms [Detail]), 'Map filter' (by Carole Poland, General, Room [List]), and 'Hotel reviews page' (by Celeste Burton, Rooms [Detail]).

# Azure Repos

无限私人 Git 存储库托管和支持 TFVC，可扩展到其他 Git 存储库



## Works with your Git client

从任何 IDE、编辑器或 Git 客户端安全地连接代码并将其推送到 Git 存储库中。



## Web hooks and API integration

从市场添加验证和扩展，或使用 Web 挂钩和 REST API 构建您自己的验证和扩展。



## Semantic code search

通过了解类和变量的代码感知搜索快速查找所需的内容。



<https://azure.com/devops>

The screenshot shows the Azure DevOps interface for the 'AdventureWorks Mobile' project. The left sidebar includes links for Overview, Boards, Repos (selected), Files, Commits, Pushes, Branches, Tags, Pull requests (selected), Pipelines, Test Plans, and Artifacts. The main content area is titled 'Pull requests' and shows a list of pull requests categorized by status: Mine, Active, Completed, and Abandoned. The 'Mine' tab is selected, showing the following pull requests:

- Initialize client with .client.init** (Kat Larsson requested #238 into master) - 6 comments
- Testing configuration settings** (Kat Larsson requested #230 into features/config) - 0 comments
- Check returned identity for null status** (Colin Ballinger requested #212 into master) - 2 comments
- [WIP] Add tests for deployment mapping** (Robin Counts requested #221 into master) - 3 comments
- Add exception on disconnect** (Colin Ballinger requested #249 into master) - 0 comments
- Maintain structure when converting isomorphs** (Robin Counts requested #234 into master) - 0 comments
- Hotfix payload to releases/99** (Robin Counts requested #201 into releases/99) - 99+ comments

# Azure Test Plans

获得端到端的可追溯性。从浏览器运行测试和记录缺陷。在整个测试生命周期中跟踪和评估质量。



## 捕获丰富的数据

在执行测试时捕获丰富的方案数据，使发现的缺陷具有可操作性。无需测试用例或测试步骤，即可浏览用户情景。可以直接从探索性测试会话创建测试用例。



## 跨 Web 和桌面进行测试

测试应用程序所在的位置。跨桌面或 Web 方案完成脚本测试。从云测试本地应用程序，反之亦然。

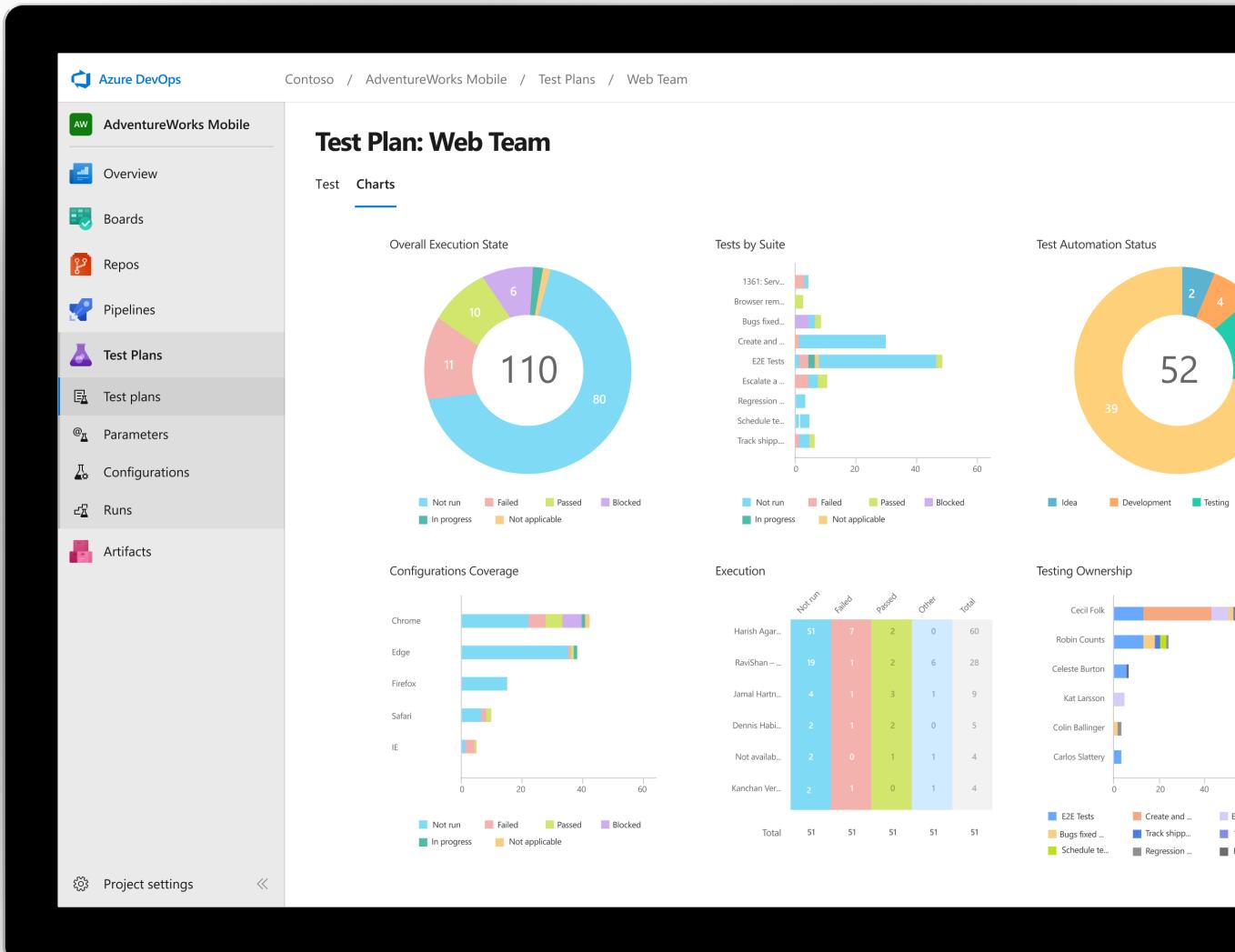


## 获得端到端的可追溯性

在工程师和用户验收测试干系人中利用相同的测试工具。仅在您需要工具时才付费。



<https://azure.com/devops>



# Azure Artifacts

创建和共享来自公共和私有来源的 Maven、npm 和 NuGet 包源 - 完全集成到 CI/CD 管道中



## Manage all package types

获取 Maven、npm 和 NuGet 的通用工作件管理。



## Add packages to any pipeline

共享包，并使用内置的 CI/CD、版本控制与测试。



## Share code efficiently

跨小型团队和大型企业轻松共享代码。



<https://azure.com/devops>

The screenshot shows the Azure DevOps interface for managing artifacts. On the left, there's a sidebar with links for 'AdventureWorks Mobile' (selected), 'Overview', 'Boards', 'Repos', 'Pipelines', 'Test Plans', and 'Artifacts'. The main area is titled 'Artifacts' and shows a list of packages with columns for Package, Views, Source, Last pushed, and Description. The packages listed are:

Package	Views	Source	Last pushed	Description
abbrev		nuget	a year ago	Like ruby's abbrev module, but in js
accepts		npmjs	a year ago	Higher-level content negotiation
acorn		MyFeed	a year ago	ECMAScript parser
acorn-dynamic-import		maven	a year ago	Support dynamic imports in acorn
aclr-jsx		nuget	a year ago	Alternative, faster React.js JSX parser
acorn-object-spread		maven	a year ago	Custom JSON-Schema keywords for ajv validator
ajv		npmjs	a year ago	Alphanumeric sorting algorithm
ajv-keywords		nuget	a year ago	ANSI escape codes for manipulating the terminal
alphanum-sort		npmjs	a year ago	An elegant lib that converts the chalked (ANSI) text to HTM

# Self-Service Dev/Test Environments

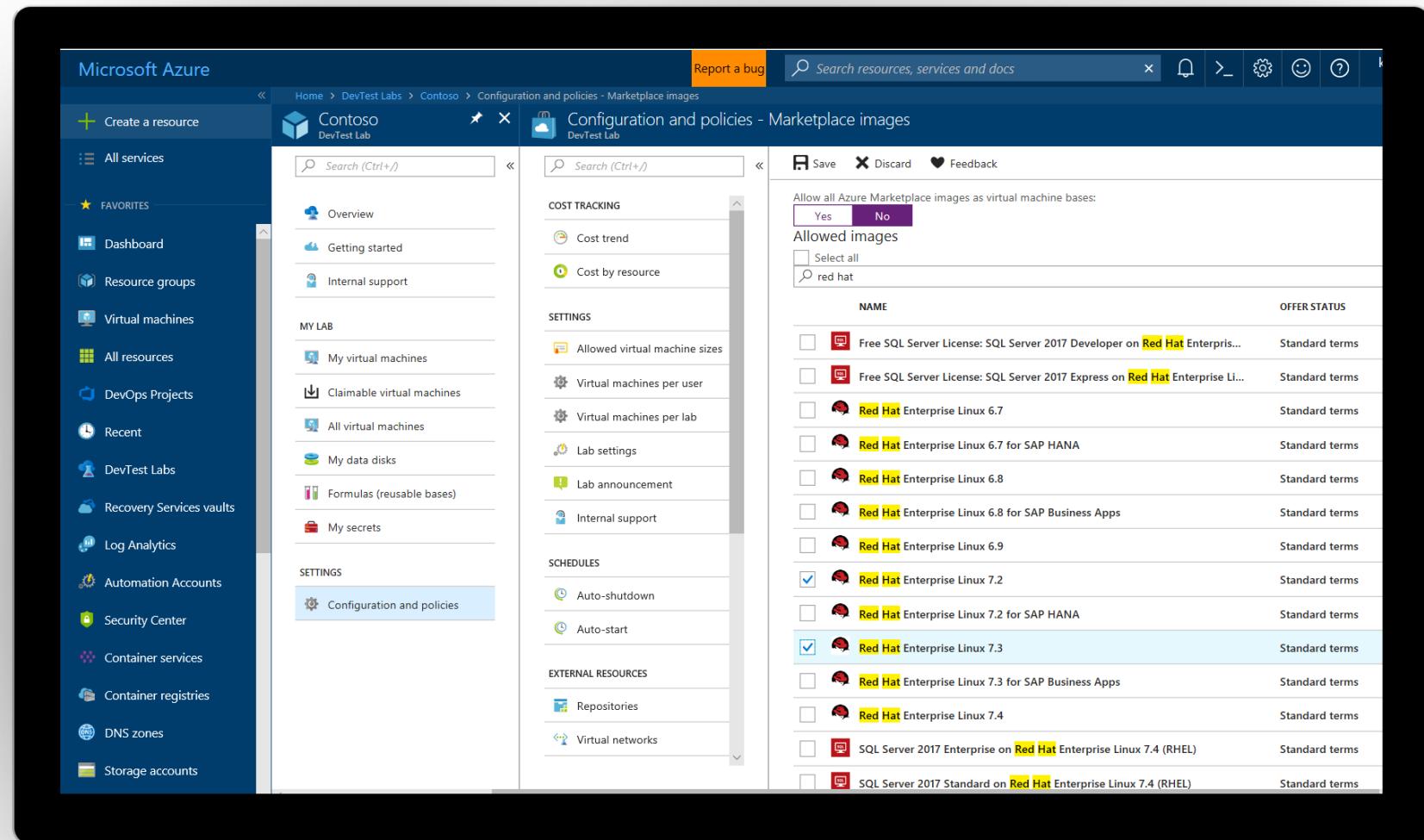
## Azure Lab Services

→ Simplify cloud environment management for developers and testers.

→ Enforce policies and control costs with full visibility

→ Use templates, custom images and formulas to reproduce environments.

→ Orchestrate with Azure Pipelines or integrate using REST API



# Infrastructure and Configuration as Code

## Azure Resource Manager, Automation & 3<sup>rd</sup> Party Integrations

→ Infrastructure as Code,  
built-in

→ Azure Config & Automation

→ Support for 3<sup>rd</sup> party and OSS  
tooling such as Terraform,  
Ansible, Chef, Puppet & SaltStack



The screenshot shows the Microsoft Azure portal interface. On the left, the 'Resource groups' blade is open, displaying a list of resource groups: AustraliaSEDevelopment, AustraliaSEProduction (selected), autoShutdown, cloud-shell-storage-westus, DefaultResourceGroup-EUS, and securitydata. The main content area shows the 'AustraliaSEProduction - Automation script' blade. It includes sections for Overview, Activity log, Access control (IAM), Tags, SETTINGS, Deployments, Policies, Properties, Locks, and Automation script (which is selected). The Automation script tab displays a JSON template for deploying resources. The template defines parameters for DNS zones, including NS and SOA records, and other variables like A\_vote\_name, A\_draft\_name, and A\_devops\_name.

```
$schema: "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#"
contentVersion: "1.0.0.0"
parameters:
  dnszones_onazure_io_name: {
    "defaultValue": "onazure.io",
    "type": "String"
  }
  NS_@_name: {
    "defaultValue": "@",
    "type": "String"
  }
  SOA_@_name: {
    "defaultValue": "@",
    "type": "String"
  }
  A_vote_name: {
    "defaultValue": "vote",
    "type": "String"
  }
  A_draft_name: {
    "defaultValue": "draft",
    "type": "String"
  }
  A_devops_name: {
    "defaultValue": "devops",
    "type": "String"
  }
  A_*.draft_name: {
    "defaultValue": ".draft",
    "type": "String"
  }
```

# Continuous Security

## Azure Security Center

→ 全面了解和控制云安全状态

→ 利用 ML 主动识别和降低风险，减少攻击风险

→ 通过高级分析快速检测和响应威胁



The screenshot shows the Azure Security Center - Overview dashboard. The top navigation bar includes 'Power BI', 'Subscriptions', and 'Log Integration'. The main area is divided into several sections:

- Overview:** Shows 14 Total recommendations (2 Healthy), 0 alerts, and 0 incidents.
- Prevention:** Breaks down into Compute (9 Total), Networking (8 Total), Storage & data (28 Total), and Applications (4 Total).
- Detection:** Shows 6 HIGH SEVERITY security alerts and 15 MEDIUM SEVERITY security alerts.
- Most attacked resources:** Shows 'vm1' with 20 Alerts.

The left sidebar contains links for 'Overview', 'Security policy', 'Quickstart', 'Welcome', 'Events Processed', 'Log search', 'PREVENTION' (Recommendations, Partner solutions, Compute, Networking, Storage & data, Applications), and 'DETECTION' (Security alerts, Most attacked resources).

# Smarter Insights, Faster

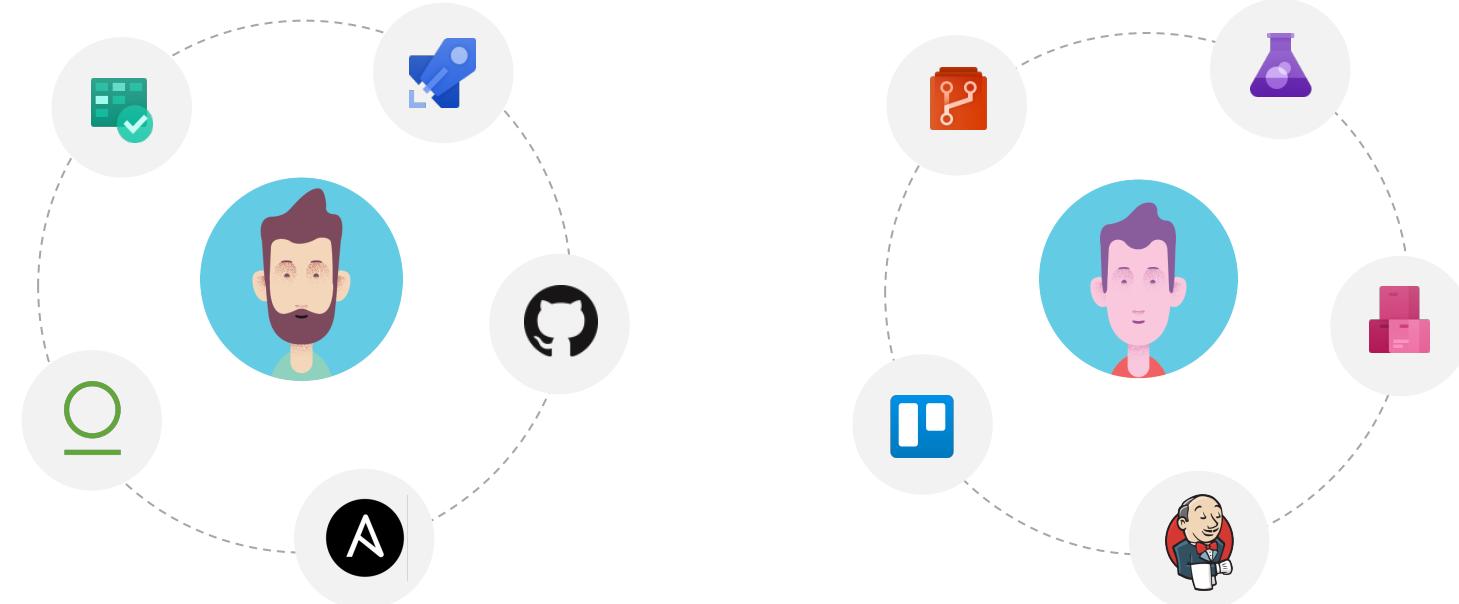
## Azure Monitor, Application Insights & Log Analytics

- Pre-defined solutions with smart thresholds
- Visualize data in intuitive and customizable dashboards
- Separate the signal from the noise and accelerate root-cause analysis
- Integrate your existing processes & tools like Service Now



# Azure DevOps: Choose the tools and clouds you love

Azure DevOps lets developers choose the tools that are right for them



Mix and match to create workflows with tools from Microsoft, open source or your favorite 3rd party tools

Target any cloud, on-prem or both and deploy to the servers you need



# Azure DevOps supports small teams to largest enterprises



“ Instead of telling people to wait for 6 months for a new feature, we can give it to them in a few weeks...Our 2800 worldwide developers can use the same backlog, user stories and tests whether they’re on Windows or Linux... building for iOS or Android.



“ Speed is gained in moving to the PaaS offering of Azure DevOps. PaaS provides regularly released features and a future-proof capability, eliminating the need for Accenture to maintain infrastructure and go through upgrade cycles. ”



“ Microsoft made it really easy to break outside the silos... and tie the DevOps process into the fulfillment of business process. Without the tools that we have today, we would not be successful. ”



“ Branches sync 500 percent faster. Builds are 400 percent faster, with the typically six-hour process reduced to 90 minutes. We (now have) a highly streamlined process that operates with a few button clicks—and one-button deployment. ”

# 1ES for DevOps

对于工程师和产品团队来说，

没有比在推动工作效率的系统更重要的事情了。

因此，在一周中的任何一天，为了生产力而权衡各种功能。

我希望我们最好的工程师在我们的工程系统上工作，以便我们以后能够来回构建我们想要的新概念。

- 萨蒂娅·纳德拉



# DevOps at Microsoft

Azure DevOps is the toolchain of choice for Microsoft engineering with over 90,000 internal users



<https://aka.ms/DevOpsAtMicrosoft>

**372k**

Pull Requests per month

**4.4m**

Builds per month

**5m**

Work items viewed per day

**2m**

Git commits per month

**500m**

Test executions per day

**500k**

Work items updated per day

**78,000**

Deployments per day

Data: Internal Microsoft engineering system activity, August 2018

# Azure DevOps Services Pricing

## Open Source Projects

**Free**

Unlimited users and build time

- Azure Pipelines: 10 parallel jobs with unlimited minutes for CI/CD
- Azure Boards: Work item tracking and Kanban boards
- Azure Repos: Unlimited public Git repos

## Small Teams

**Free**

Start free with up to 5 users

- Azure Pipelines: Run 1 Microsoft-hosted job for 1,800 minutes per month and 1 self-hosted job for any amount of time
- Azure Boards: Work item tracking and Kanban boards
- Azure Repos: Unlimited public Git repos
- Azure Artifacts: package management
- Unlimited stakeholders

## Teams of any size

**Starts at \$6**

per user, per month for Boards & Repos\*

Easy pricing that grows with your team

- Azure Pipelines: Run 1 Microsoft-hosted job for 1,800 minutes per month and 1 self-hosted job for any amount of time
- Azure Boards: Work item tracking and Kanban boards
- Azure Repos: Unlimited public Git repos
- Azure Artifacts: package management
- Unlimited stakeholders
- Boards & Repos included for Visual Studio subscribers

\* 5 Boards & Repos users and 5 Artifacts users free. Pipelines with unlimited minutes, Test Plans users and additional Artifacts users also available. Please see the Azure pricing calculator for details.



<https://azure.com/pricing/details/devops/>

# Global Reach

**Azure DevOps has more global regions than any other cloud provider**



# Thank You

ευχαριστώ Salamat Po متشرّم شكرًا Grazie

благодаря ありがとうございます Kiitos Teşekkürler 谢谢

ឃុំបញ្ជីណូរវិប Obrigado شكريه Terima Kasih Dziękuję

Hvala Köszönöm Tak Dank u wel дякую Tack

Mulțumesc спасибо Danke Cám ơn Gracias

多謝晒 Ďakujem הַתֵּוֶל දෙන්ගි Děkuji 감사합니다



# Additional resources

## Additional Azure-related elements from across Microsoft

(may require Corpnet access)

### Branding

[Brand Central](#)

[C+E Brand Guidelines](#)

[Brand Architecture at Microsoft](#)

### Style Guides

[Microsoft Cloud Style Guide](#)

[Azure DevOps Branding Guide](#)

### PowerPoint templates

[C+E branded template](#)

[Azure branded template](#)

[APEX | CDA branded template](#)

### Iconography

[C+E Icon set](#)