



Azure DevOps Vs. DevOps on Azure

Josh Garverick
March 5, 2019



A Bit About Me



Microsoft MVP, Developer Technologies (2015-Present)



ALM | DevOps Rangers (2014-Present)



MCSE, Cloud Platform and Infrastructure (2017)



Co-Host, RadioTFS (2016-Present)



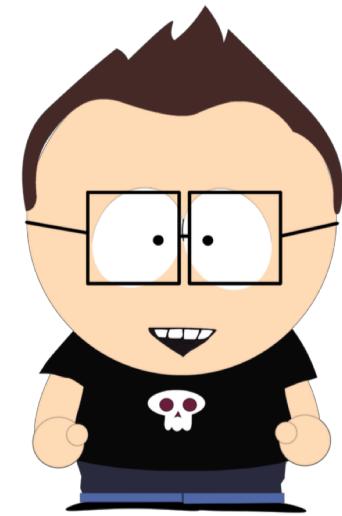
Buffalo, NY



@jgarverick



<https://joshgarverick.blogspot.com>



Azure DevOps

#AzureDevOps



<https://azure.com/devops>



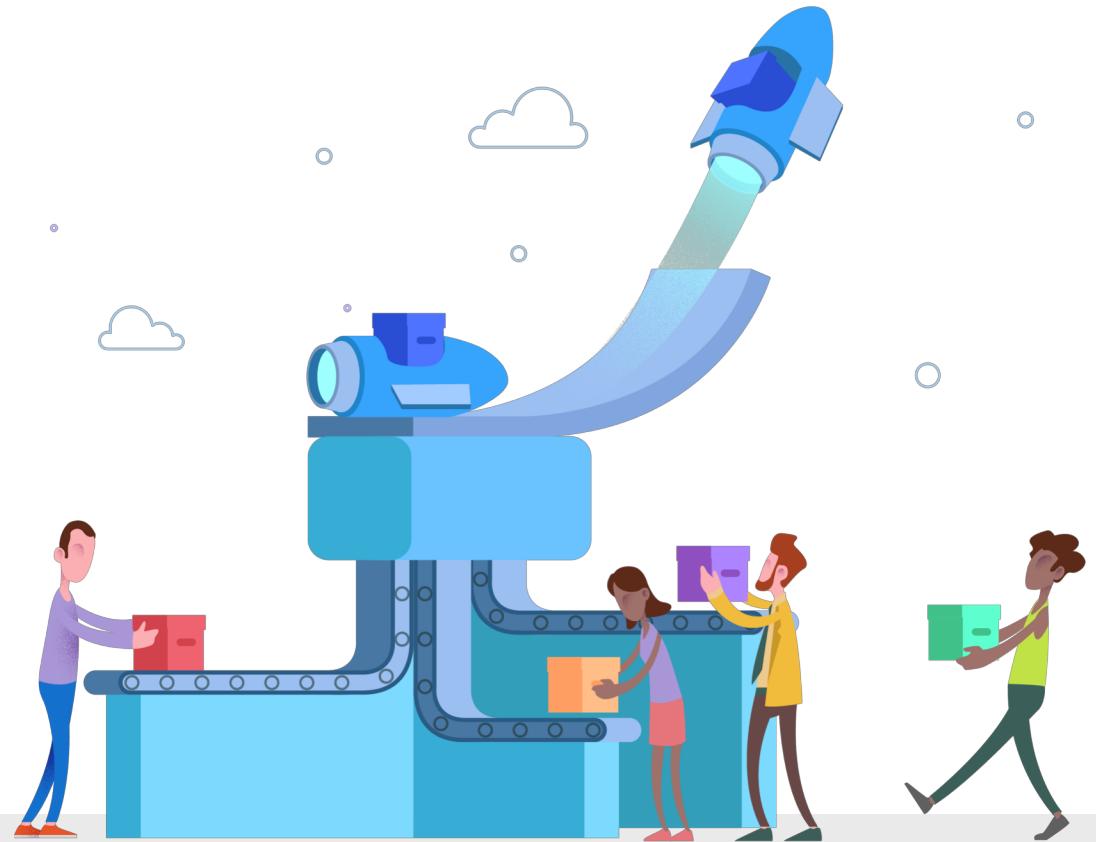
@AzureDevOps



<https://aka.ms/AzureDevOpsForum>



<https://aka.ms/DevOpsBlog/>



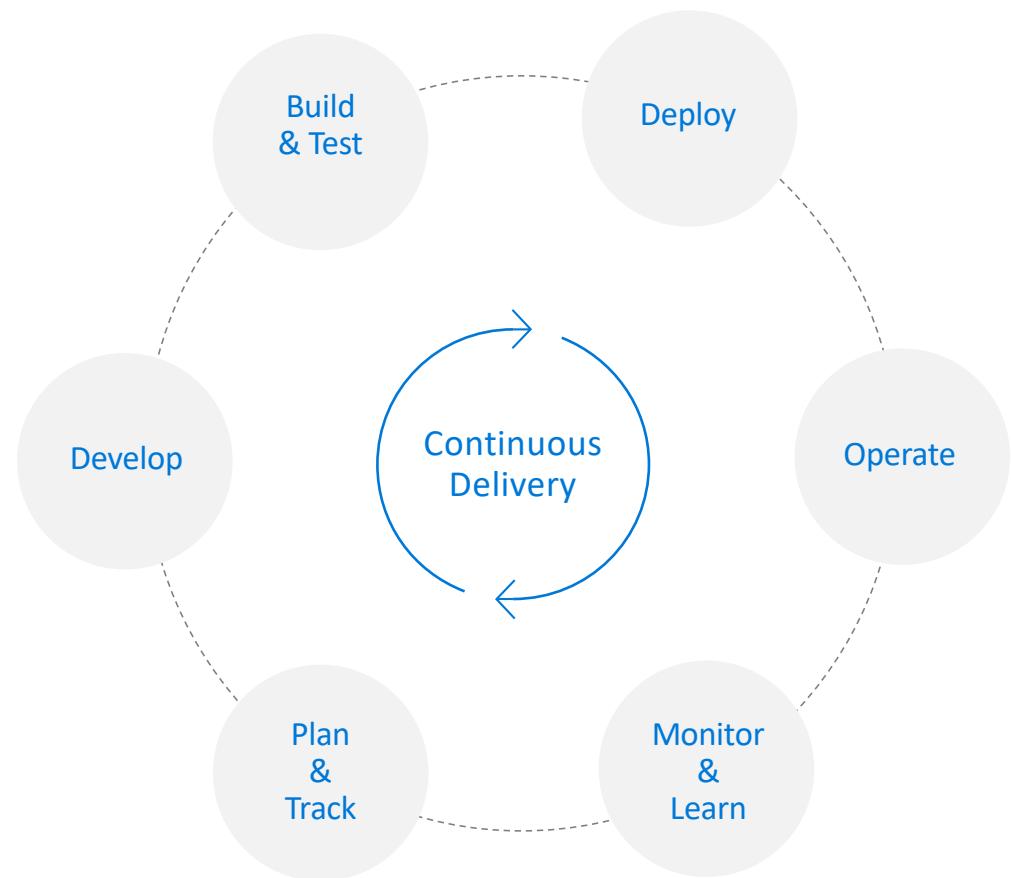
What is DevOps?

People. Process. Products.

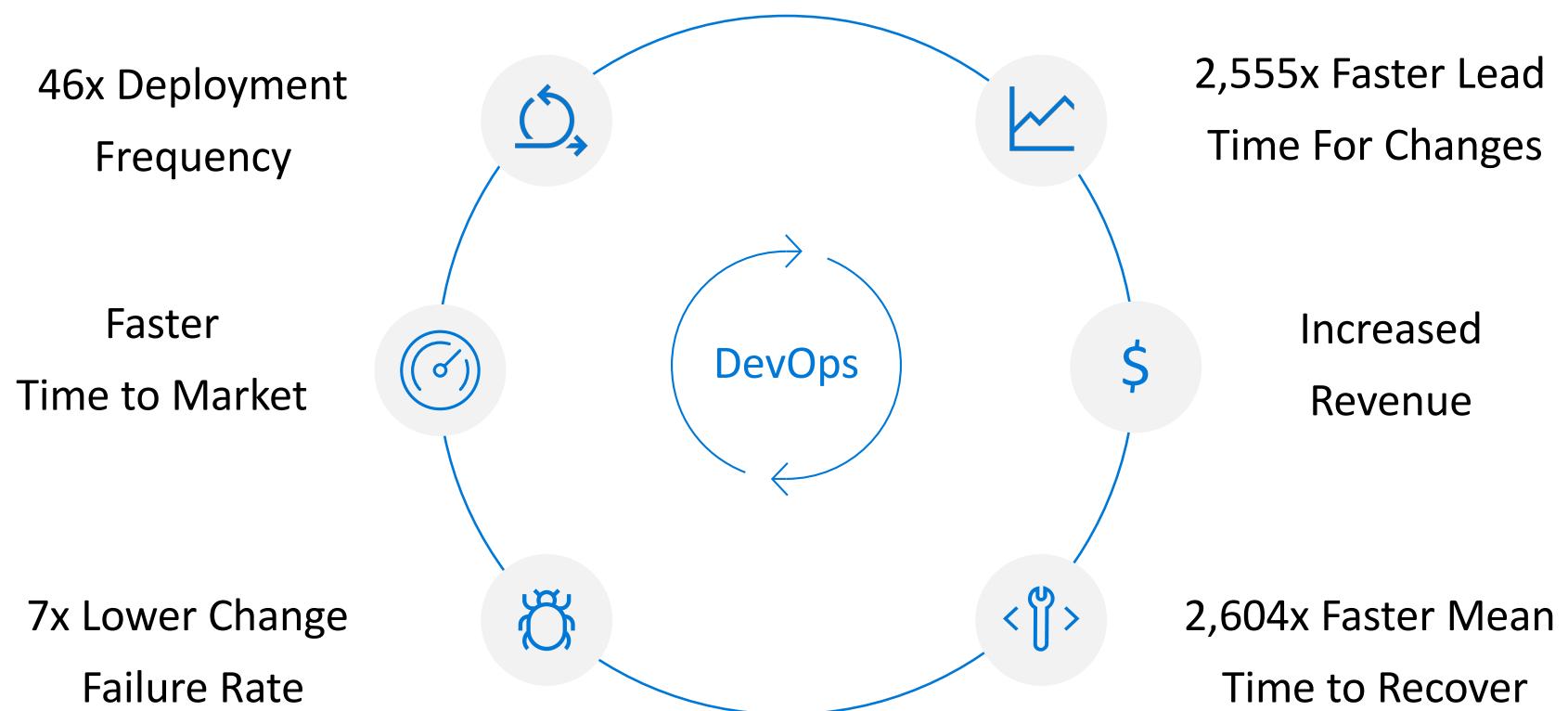
“

DevOps is the union of **people**, **process**, and **products** to enable continuous delivery of value to your end users.

”



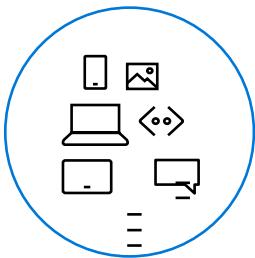
High Performance DevOps Companies Achieve...



Source: 2018 Accelerate: State of DevOps: Strategies for a New Economy." N. Forsgren, J. Humble, G. Kim. DevOps Research and Assessment (DORA)

How Microsoft can help

Microsoft Azure is a powerful and flexible foundation for past, present, and future apps – easily build, manage, and deploy any application and any stack on a massive, global network using your favorite tools and frameworks.

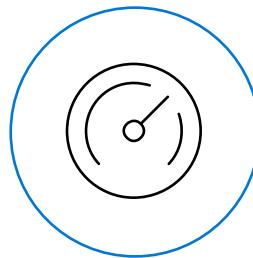


Flexible

Choice of IaaS, PaaS, public cloud or hybrid.

Mirror or modernize app infrastructure with VMs, containers, microservices or serverless.

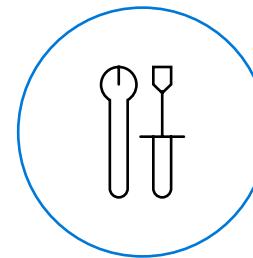
Supports all stages of the app modernization journey – from lift-and-shift to Cloud-Native.



Powerful

Instantly improve the performance, scalability and resiliency of your apps by moving them to the cloud.

Increase business agility with Cloud-Native capabilities and built-in DevOps for continuous innovation.



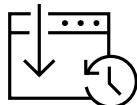
Open

Bring your stack, we bring a cloud that runs any app, on any platform, and any language.

Build applications using the language and tools of your choice - Azure supports what you already use and love so you can get up and running fast – just bring code.

What technologies do I need to support DevOps?

DevOps brings together people, processes, and technology, automating software delivery to provide continuous value to your users. Using Azure DevOps, you can deliver software faster and more reliably - no matter how big your IT department or what tools you're using.



Continuous Integration (CI)

- Improve software development quality and speed.
- When you use Azure Pipelines or Jenkins to build apps in the cloud and deploy to Azure, each time you commit code, it's automatically built and tested and bugs are detected faster.

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Continuous Deployment (CD)

- By combining continuous integration and infrastructure as code (IaC), you'll achieve identical deployments and the confidence to deploy to production at any time.
- With continuous deployment, you can automate the entire process from code commit to production if your CI/CD tests are successful.



Continuous Learning & Monitoring

- With Azure Application Insights you can identify how your applications are performing and test if the recent deployment made things better or worse.
- Using CI/CD practices, paired with monitoring tools, you'll be able to safely deliver features to your customers as soon as they're ready.

Introducing Azure DevOps



Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.



Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.



Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.

Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.



<https://azure.com/devops>

Azure Pipelines

Cloud-hosted pipelines for Linux, Windows and macOS,
with unlimited minutes for open source



Any language, any platform, any cloud

Build, test, and deploy Node.js, Python, Java, PHP, Ruby, C/C++, .NET, Android, and iOS apps. Run in parallel on Linux, macOS, and Windows. Deploy to Azure, AWS, GCP or on-premises



Extensible

Explore and implement a wide range of community-built build, test, and deployment tasks, along with hundreds of extensions from Slack to SonarCloud. Support for YAML, reporting and more



Containers and Kubernetes

Easily build and push images to container registries like Docker Hub and Azure Container Registry. Deploy containers to individual hosts or Kubernetes.



Best-in-class for open source

Ensure fast continuous integration/continuous delivery (CI/CD) pipelines for every open source project. Get unlimited build minutes for all open source projects with up to 10 free parallel jobs across Linux, macOS and Windows

The screenshot shows the Azure DevOps Pipelines interface for the AdventureWorks project. It displays three parallel jobs: Windows Job (Running, 1m 53s), Linux Job (Running, 3m 29s), and macOS Job (Running, 3m 07s). The Linux Job details page is shown, listing the following steps:

- Prepare job
- Initialize job
- Get sources
- Cmdline
- Nodetool
- Install dependencies

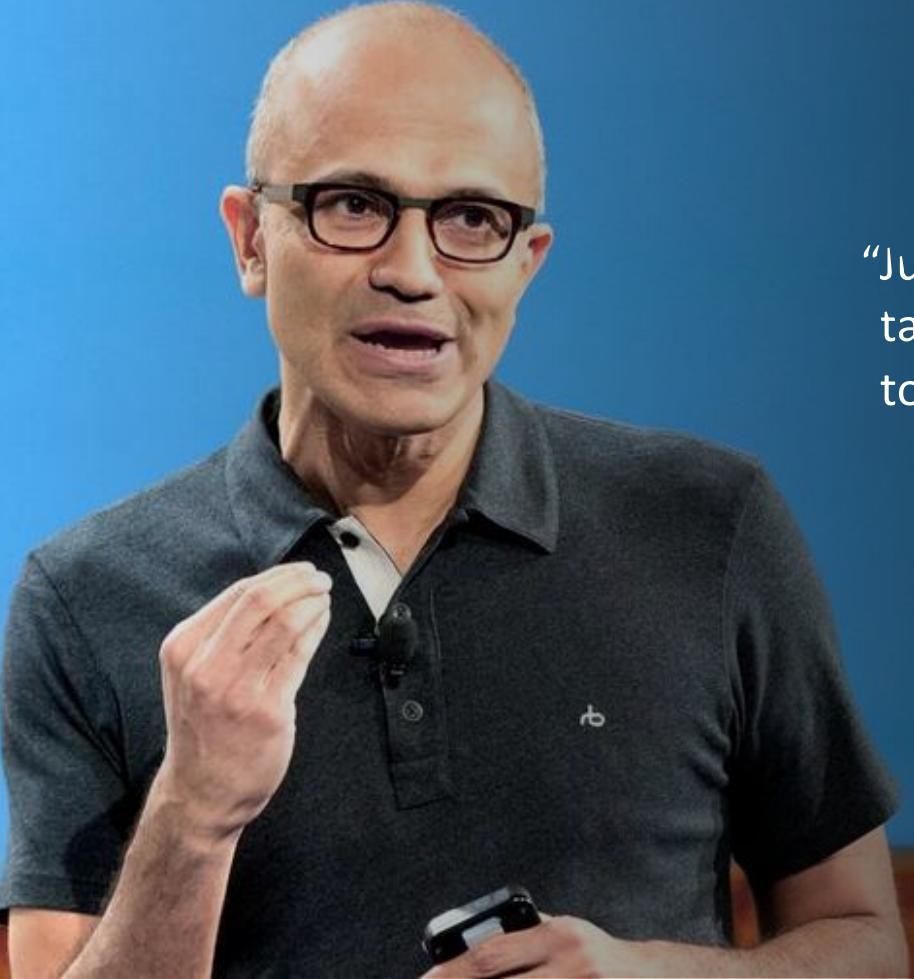
The logs for the Linux job show the following command output:

```
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/tsserverlibraryServices.js'
```



<https://azure.com/pipelines>

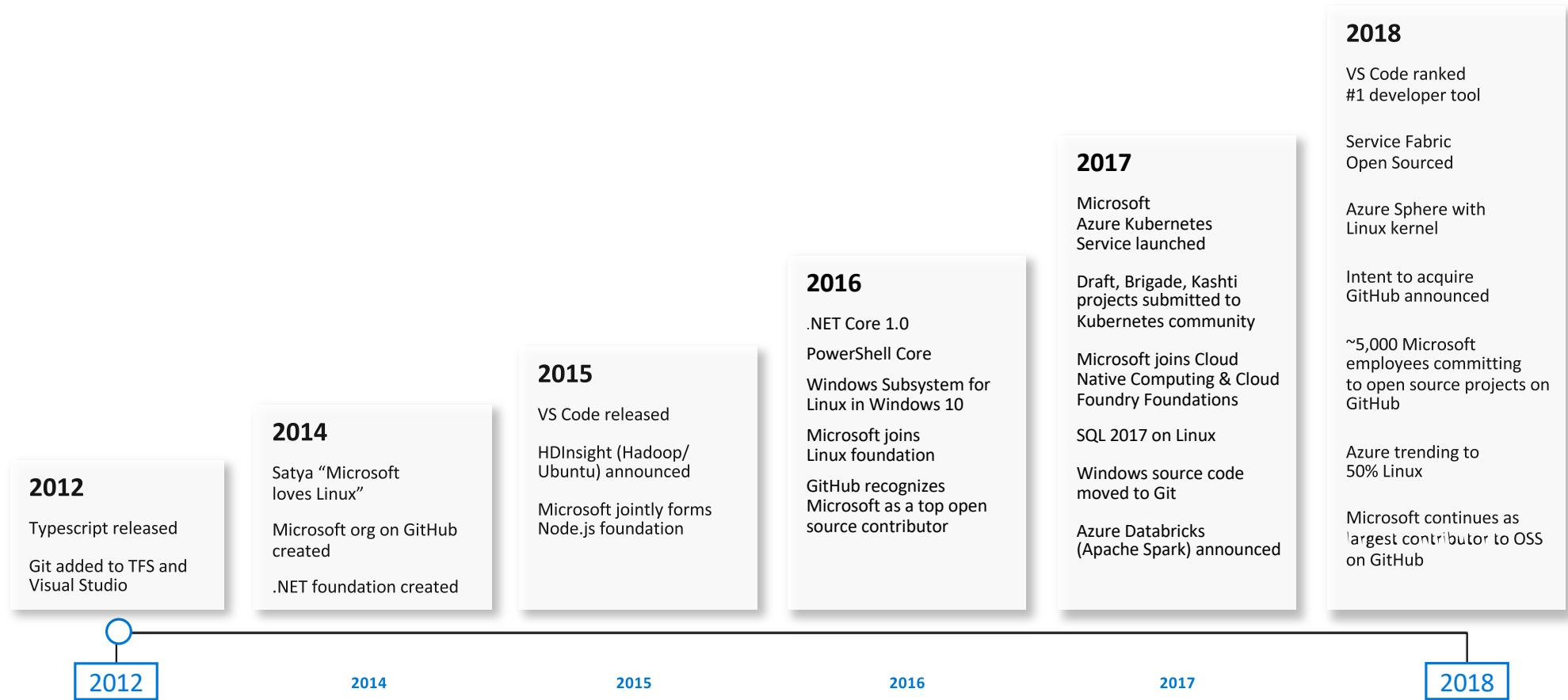
A photograph of Satya Nadella, CEO of Microsoft. He is a middle-aged man with short, light-colored hair and glasses, wearing a dark grey polo shirt. He is gesturing with his right hand while holding a small device in his left hand. The background is a solid blue.

“Judge us by the actions we have
taken in the recent past, our actions
today and in the future”

—Satya Nadella, CEO
Microsoft

2018

Microsoft ❤️ Open Source





Azure Pipelines

Free unlimited build minutes for public projects

Up to 10 free parallel jobs across Windows, Linux and macOS



<https://azure.com/pipelines>

Microsoft ❤️ Open Source



Integrated with GitHub

Azure Pipelines available now to
any developer from the GitHub
Marketplace

The screenshot shows the GitHub Marketplace interface. At the top, there's a navigation bar with icons for search, pull requests, issues, marketplace, and explore. Below the navigation, the URL 'Marketplace / Azure Pipelines' is visible. On the left, there's a sidebar with a circular icon containing a blue gear-like shape, followed by 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 main content area has a heading 'Azure Pipelines' with two buttons: 'Set up a new plan' (green) and 'Edit your plan ▾'. Below this, a sub-headline reads 'Continuously build, test, and deploy to any platform and cloud'. A descriptive text block states: '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. At the bottom, there's a large blue callout box with the heading 'Linux, macOS, and Windows agents' and a subtext: 'Simplify managing hardware and VMs by using Microsoft cloud-hosted agents. Get full CI/CD pipeline support for every major platform and tool.' It shows four status boxes: 'Test' (27 succeeded), 'Build Linux' (6 succeeded), 'Build Windows' (2 succeeded), and 'Build macOS' (46% in progress).

Azure DevOps



Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.



Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.



Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.



Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.



<https://azure.com/devops>

Azure Boards

Track work with Kanban boards, backlogs, team dashboards, and custom reporting



Connected from idea to release

Track all your ideas at every development stage and keep your team aligned with all code changes linked directly to work items.



Scrum ready

Use built-in scrum boards and planning tools to help your teams run sprints, stand-ups, and planning meetings.



Project insights

Gain new insights into the health and status of your project with powerful analytics tools and dashboard widgets.



<https://azure.com/devops>

The screenshot shows the Azure DevOps Boards interface. On the left, there's a sidebar with navigation links: Overview, Boards, Work Items, Backlogs, Sprints, Queries, Plans, Repos, Pipelines, Test Plans, and Artifacts. The 'Boards' link is currently selected. The main area is titled 'FabrikamFiber Board'. At the top of this area, there are four tabs: 'New', 'Active', '5/5', 'Staging', and 'Deployed'. Below these tabs, there are several columns representing different work items, each with a title, a brief description, and a list of team members involved. The work items include: 'Home page (selected room)', 'Home page (no room selected)', 'Top page controls', 'Entry + validations', 'Footer', 'Code of Cond...', 'Mobile (Spike)', 'Search component complex features', 'Navigation menu', 'Login page', 'Ambient settings', 'Images from api', 'Adapt some parts of UI to UWP for Desktop', 'Map filter', 'Hotel reviews page', and 'Notifications list'. Each item has a small icon next to its title and a 'Details' button.

Azure Repos

Unlimited private Git repo hosting and support for TFVC that scales from a hobby project to the world's largest Git repositories



Works with your Git client

Securely connect with and push code into your Git repos from any IDE, editor, or Git client.



Web hooks and API integration

Add validations and extensions from the marketplace or build your own using web hooks and REST APIs.



Semantic code search

Quickly find what you're looking for with code-aware search that understands classes and variables.



<https://azure.com/devops>

The screenshot shows the Azure DevOps interface for the 'AdventureWorks Mobile' repository. 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 creator: 'Created by me', 'Assigned to me', and 'Assigned to my team'. Each pull request entry includes the author's name, the title of the PR, and the target branch. The interface also features a filter bar at the top and a 'Project settings' button at the bottom.

Category	Pull Request	Author	Target Branch	Comments
Created by me	Initialize client with .client.init	Kat Larsson	master	6
	Testing configuration settings	Kat Larsson	features/config	0
Assigned to me	Check returned identity for null status	Colin Ballinger	master	1
	[WIP] Add tests for deployment mapping	Robin Counts	master	3
Assigned to my team	Add exception on disconnect	Colin Ballinger	master	0
	Maintain structure when converting isomorphs	Robin Counts	master	0
	Hotfix payload to releases/99	Robin Counts	releases/99	99+

Azure Test Plans

Get end-to-end traceability. Run tests and log defects from your browser. Track and assess quality throughout your testing lifecycle.



Capture rich data

Capture rich scenario data as you execute tests to make discovered defects actionable. Explore user stories without test cases or test steps. You can create test cases directly from your exploratory test sessions.



Test across web and desktop

Test your application where it lives. Complete scripted tests across desktop or web scenarios. Test on-premises application from the cloud and vice-versa.

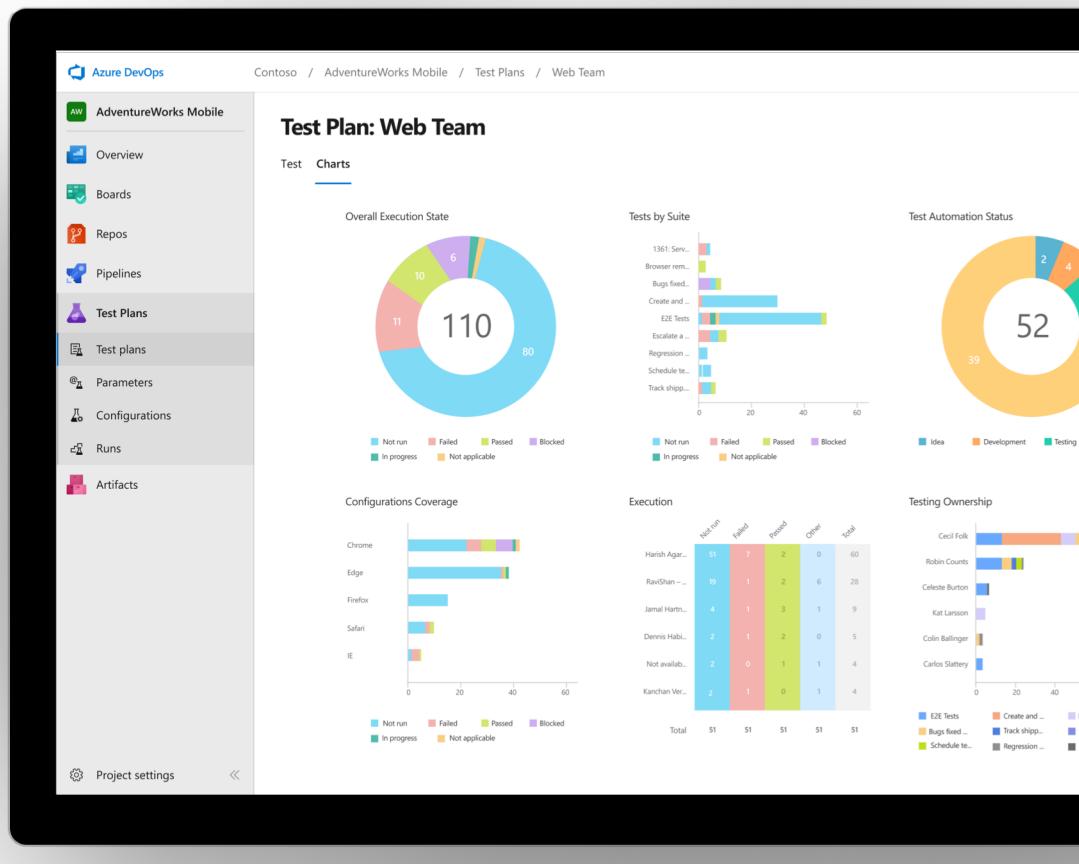


Get end-to-end traceability

Leverage the same test tools across your engineers and user acceptance testing stakeholders. Pay for the tools only when you need them.



<https://azure.com/devops>



Azure Artifacts

Create and share Maven, npm, and NuGet package feeds from public and private sources – fully integrated into CI/CD pipelines



Manage all package types

Get universal artifact management for Maven, npm, and NuGet.



Add packages to any pipeline

Share packages, and use built-in CI/CD, versioning, and testing.



Share code efficiently

Easily share code across small teams and large enterprises.

The screenshot shows the Azure DevOps interface for managing artifacts. On the left, there's a sidebar with links for Overview, Boards, Repos, Pipelines, Test Plans, and Artifacts. The Artifacts link is highlighted. The main area is titled "Artifacts" and shows a list of packages. Each package entry includes the name, version, source (NuGet or npmjs), last pushed date, and a brief description. The packages listed are abbrev (Version 1.1.0), accepts (Version 1.3.3), acorn (Version 5.0.3), acorn-dynamic-import (Version 2.0.2), aclr-jsx (Version 3.0.1), acorn-object-spread (Version 1.0.0), ajv (Version 4.11.7), ajv-keywords (Version 1.5.1), and alphanum-sort (Version 1.4.0).

Package	Views	Source	Last pushed	Description
abbrev	Version 1.1.0	nuget	a year ago	Like ruby's abbrev module, but in js
accepts	Version 1.3.3	npmjs	a year ago	Higher-level content negotiation
acorn	Version 5.0.3	MyFeed	a year ago	ECMAScript parser
acorn-dynamic-import	Version 2.0.2	maven	a year ago	Support dynamic imports in acorn
aclr-jsx	Version 3.0.1	nuget	a year ago	Alternative, faster React.js JSX parser
acorn-object-spread	Version 1.0.0	maven	a year ago	Custom JSON-Schema keywords for ajv validator
ajv	Version 4.11.7	npmjs	a year ago	Alphanumeric sorting algorithm
ajv-keywords	Version 1.5.1	nuget	a year ago	ANSI escape codes for manipulating the terminal
alphanum-sort	Version 1.4.0	npmjs	a year ago	An elegant lib that converts the chalked (ANSI) text to HTM



<https://azure.com/devops>

Azure DevOps

Better together



Azure Boards



Azure Repos



Azure Pipelines



Azure Test Plans



Azure Artifacts

An end-to-end solution for organizations looking for an enterprise-grade toolchain

Fully Integrated
with end
to end
traceability

Scalable to
any team
and project size

Highly available,
multi region,
hybrid
cloud &
on-prem

Customer
Support

Consistent
admin
and access
control



<https://azure.com/devops>

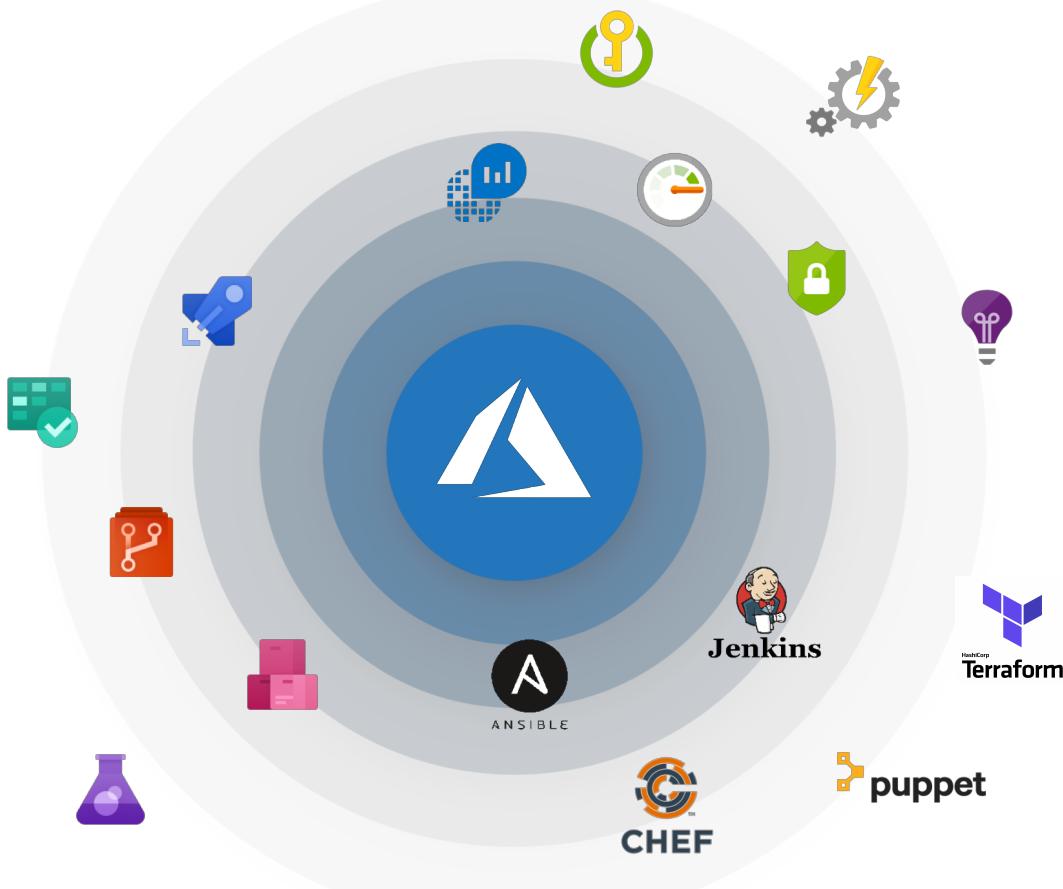
#AzureDevOps

Demo

DevOps on Azure

Josh Garverick

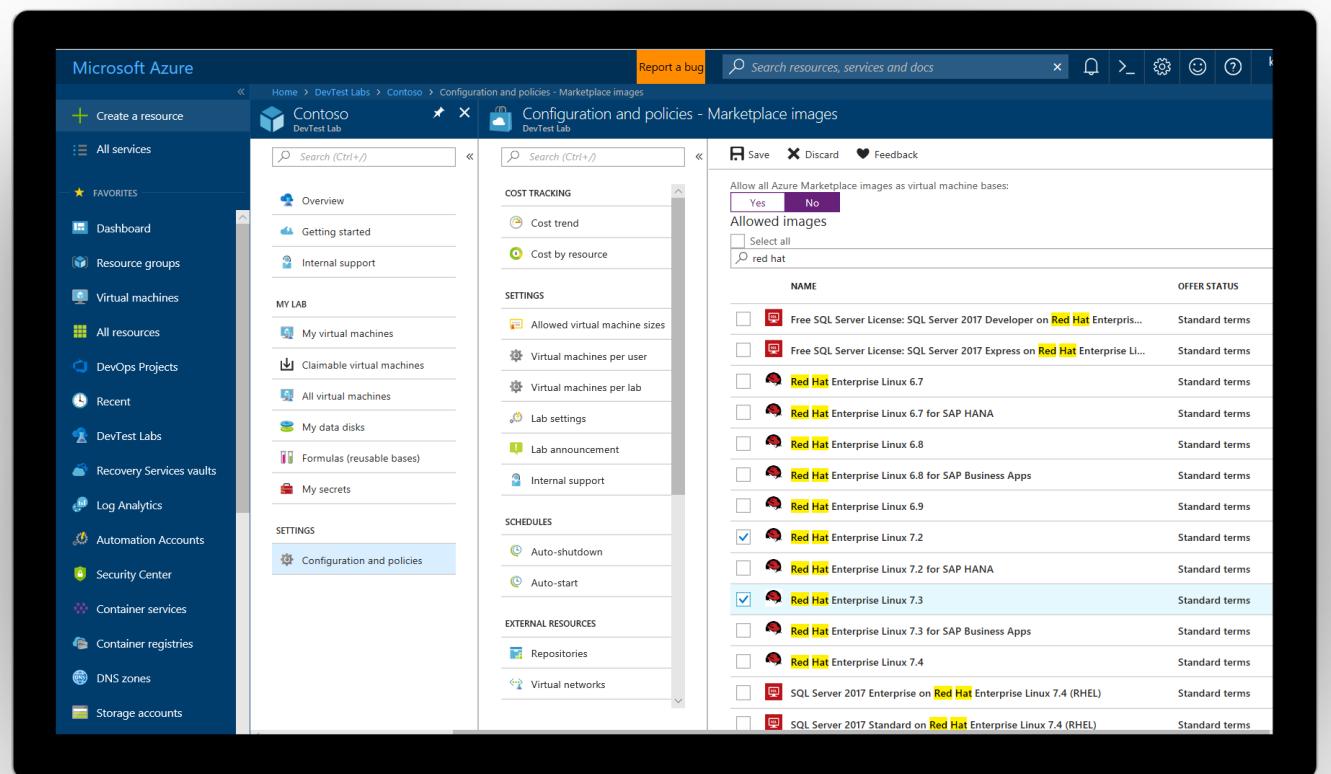
Broadening the Azure Ecosystem



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 & 3rd Party Integrations

→ Infrastructure as Code,
built-in

→ Azure Config & Automation

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



The screenshot shows the Microsoft Azure portal interface. On the left, the navigation menu includes 'Create a resource', 'All services', 'Resource groups', 'Virtual machines', 'All resources', 'DevOps Projects', 'Recent', 'Dev/Test Labs', 'Recovery Services vaults', 'Log Analytics', 'Automation Accounts', 'Security Center', 'Container services', 'Container registries', 'DNS zones', 'Storage accounts', 'App Services', 'Virtual networks', 'Availability sets', and 'Route tables'. The 'Resource groups' section lists 'AustraliaSEDevelopment', 'AustraliaSEProduction', 'autoShutdown', 'cloud-shell-storage-westus', 'DefaultResourceGroup-EUS', and 'securitydata'. The main content area shows the 'AustraliaSEProduction - Automation script' page. The 'Template' tab is selected, displaying a JSON template. The template defines parameters and resources, including DNS zones and NS records. The code is as follows:

```
1  "$schema":  
2   "https://schemas.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#"  
3   "contentVersion": "1.0.0.0",  
4   "parameters": {  
5     "dnszones_onazure_io_name": {  
6       "defaultValue": "onazure.io",  
7       "type": "String"  
8     },  
9     "NS_A_name": {  
10       "defaultValue": "@",  
11       "type": "String"  
12     },  
13     "SOA_A_name": {  
14       "defaultValue": "@",  
15       "type": "String"  
16     },  
17     "A_vote_name": {  
18       "defaultValue": "vote",  
19       "type": "String"  
20     },  
21     "A_draft_name": {  
22       "defaultValue": "draft",  
23       "type": "String"  
24     },  
25     "A_devops_name": {  
26       "defaultValue": "devops",  
27       "type": "String"  
28     },  
29     "A_*.draft_name": {  
30       "defaultValue": "*_.draft",  
31       "type": "String"  
32     }  
},  
"resources": [
```

Continuous Security

Azure Security Center

- Gain full visibility and control of your cloud security state
- Leverage ML to Proactively identify and mitigate risks to reduce exposure to attacks
- Quickly detect and respond to threats with advanced analytics



The screenshot displays the Azure Security Center - Overview page. The top navigation bar includes links for Power BI, Subscriptions, Log Integration, Overview, Recommendations (14 Total), Partner solutions (2 Healthy), New alerts & incidents (0), Policy, and Quickstart.

The main content area is divided into three sections: Prevention, Detection, and Most attacked resources.

- Prevention:** Shows four categories: Compute (9 Total), Networking (8 Total), Storage & data (28 Total), and Applications (4 Total). Each category has a progress bar indicating the total number of items.
- Detection:** Shows the number of security alerts: 6 (Low), 15 (High, highlighted in red), and 4 (Medium).
- Most attacked resources:** Shows a list with one item: vm1 with 20 Alerts.

Smarter Insights, Faster

Azure Monitor, Application Insights & Log Analytics

→ Pre-defined solutions with smart thresholds

→ Visualize data in intuitive and customizable dashboards

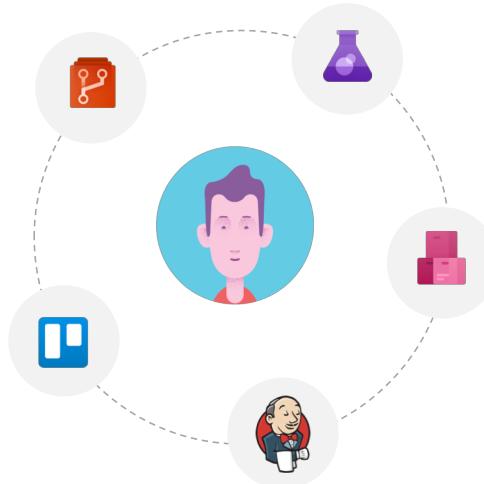
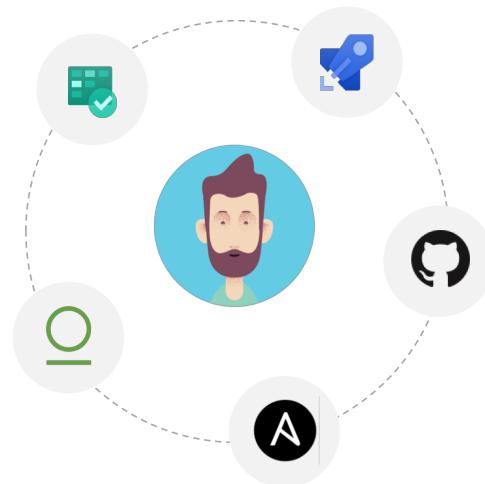
→ Separate the signal from the noise and accelerate root-cause analysis

→ Integrate your existing processes & tools like Service Now



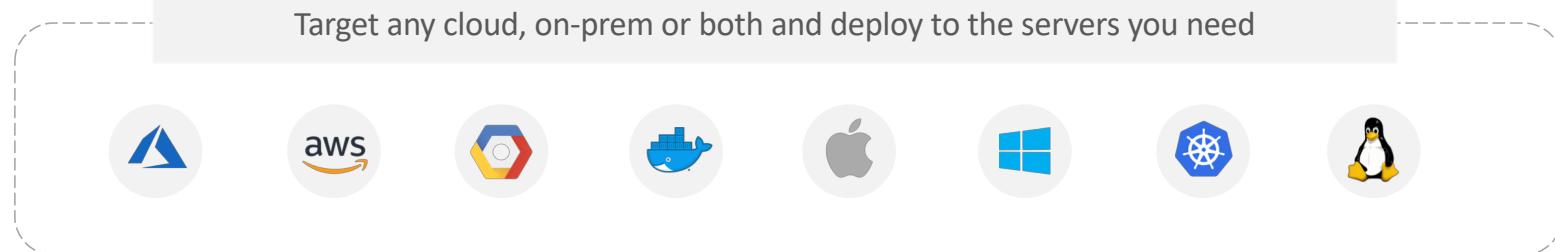
Azure DevOps: Choose the tools and clouds you love

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. ”



“ 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. ”



“ 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. ”



“ 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. ”

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



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>

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 private Git repos
- Azure Artifacts: package management
- Load testing (20,000 VUMs/month)
- 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 private Git repos
- Azure Artifacts: package management
- Load testing (20,000 VUMs/month)
- Unlimited stakeholders
- Visual Studio subscribers included free



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

* 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.

Thank You

ευχαριστώ Salamat Po متشکرم شکرًا Grazie

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

ខូបគុណគ្នា Obrigado شكريه Terima Kasih Dziękuję

Hvala Köszönöm Tak Dark u wel ດັກູໂ ຕັກ

Mulțumesc спасибо Danke Cám ơn Gracias

多謝晒 Ďakujem הַדָּוֶת දේකුඩි Děkuji 감사합니다



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