

# 微软全球研发团队在构建统一工程体系过程中的云端架构设计转型实践

*Architecting for the Cloud in Creating One Engineering System at Microsoft*

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<http://visualstudio.com/devops>



# About Me:

Sam Guckenheimer

微软公司 软件工程平台产品总设计师

Product Owner, Visual Studio Cloud Services

>30 years software industry

>13 years Microsoft

2005-2010 led Agile Transformation

Agile Conference 2014 keynote

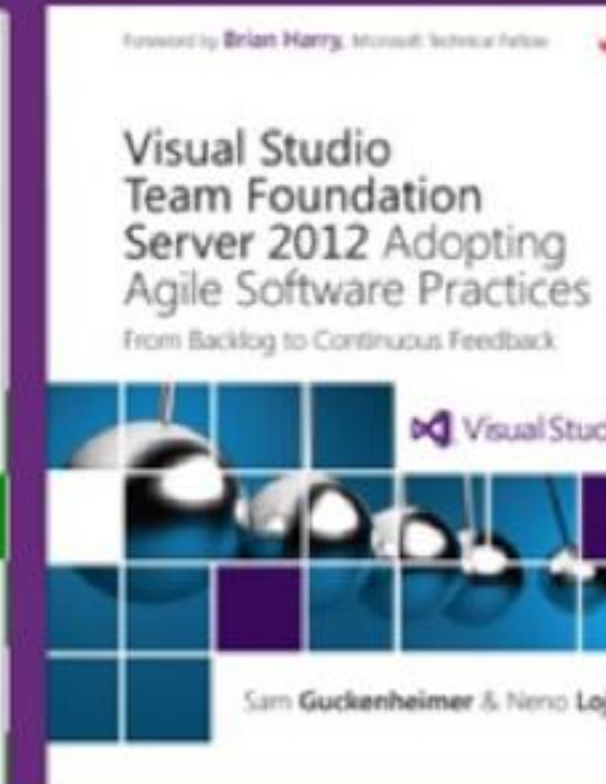
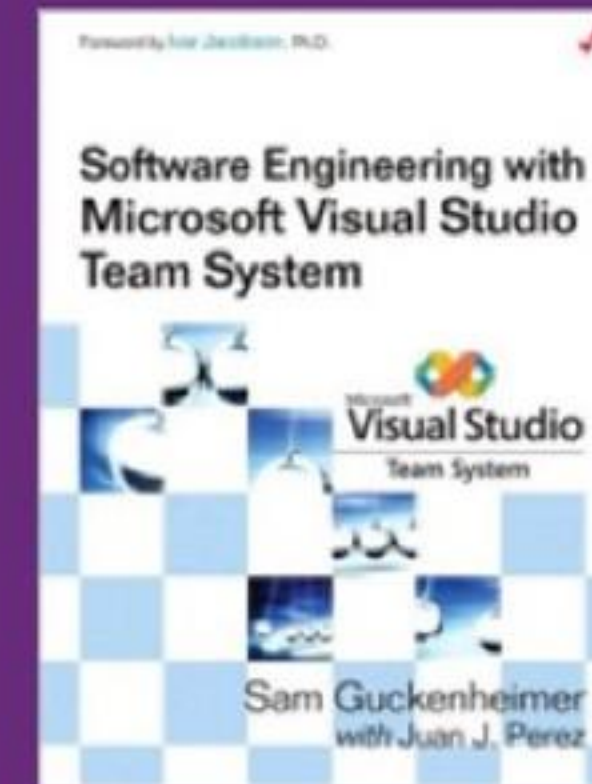
2010...from Agile to DevOps

Rugged DevOps Connect

DevOps Enterprise Summit (#DOES15 & #DOES16)

@samguckenheimer

<http://aka.ms/devops>







促进软件开发领域知识与创新的传播



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2017年7月7-8日 深圳·华侨城洲际酒店

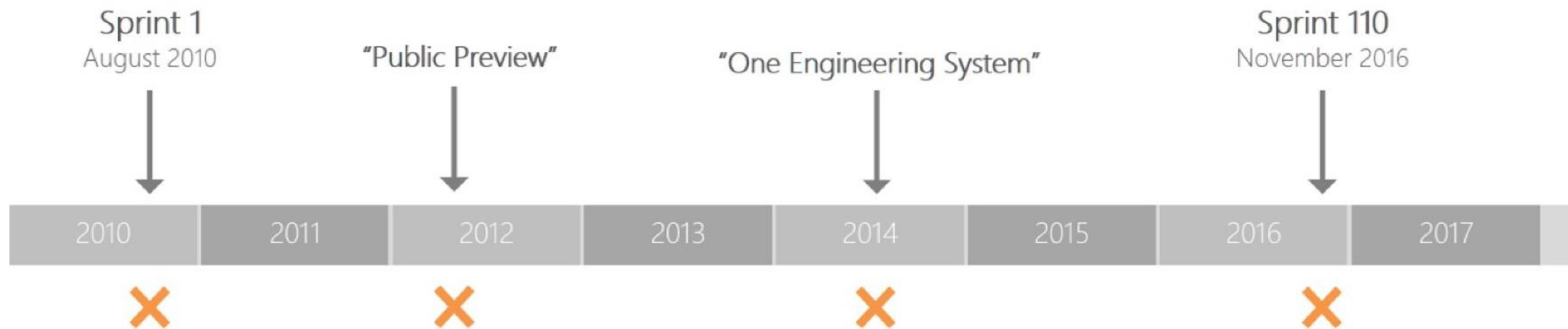
咨询热线: 010-89880682



# The Journey 微软的研发体系转型之旅



Visual Studio Team Services





# 微软“统一工程体系 (1ES)”的策略目标

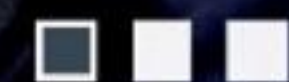
## *Purpose of One Engineering System*

If you want to go fast, go alone. If you want to go far, go together. (獨行快，眾行远)

### One Engineering System

Learn about the  
importance of 1ES

“In order to deliver the experiences our customers need for the mobile-first and cloud-first world, we will modernize our engineering processes to be customer-obsessed, data-driven, speed-oriented and quality-focused...”



“为了交付客户在移动优先、云优先的世界中所需要的使用体验，我们将会把我们的工程过程现代化，与客户密切联系，讲求数据驱动，重视交付速度，并专注质量。” ~ Satya Nadella，微软公司首席执行官

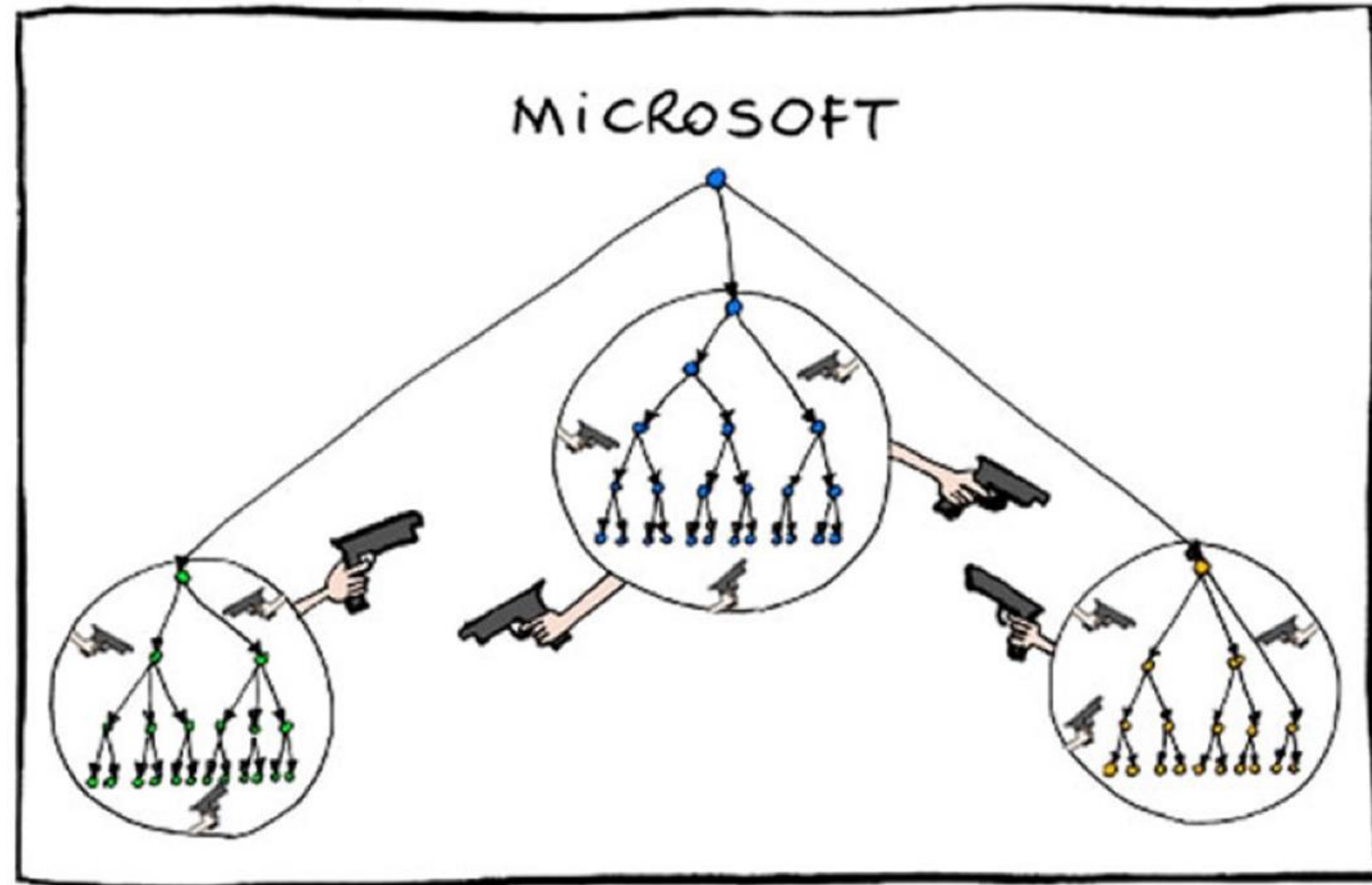


## Before 1ES （在进行统一工程体系构建之前）

Unintended  
consequence:

No reuse  
would go  
unpunished.

意料之外的  
后果：  
各自为政



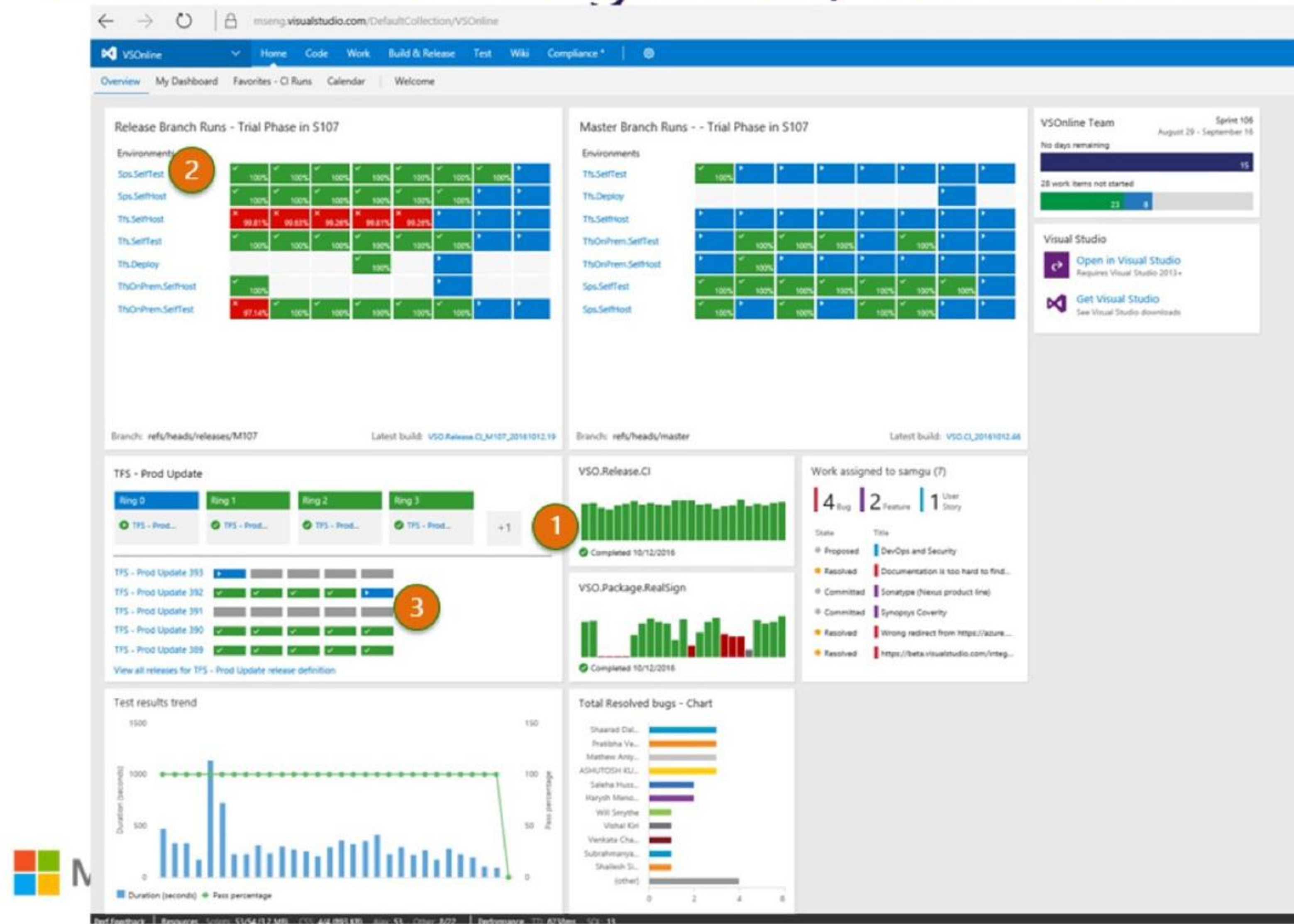


# An engineering north star...

- ...the source across the company is available to anyone
- ...any dev can offer improvements to anything in the company
- ...the IP the company has built up over the years is made of re-usable components
- ...anybody can find and potentially re-use components from anywhere else
- ...devs are rewarded for creating popular components
- ...there is zero lag from when a dev makes a change & when the rest of the company sees it
- ... build and test time is directly proportional to the change made
- ...devs can move to another team and already know how to work



# Continuous Integration/Continuous Delivery



1. Continuous Integration builds on every commit to Master
2. Test runs triggered by CI\_Build
3. Deployment across rings triggered by tests (using exposure control)



# Tracking Deployments to Production (5 Rings)

mseng.visualstudio.com/VSOOnline/Service%20Insights/\_apps/hub/ms.vss-releaseManagement-web.hub-explorer?definitionId=1206\_a=releases

VSOnline / Service Insights

Home Code Work Build & Release Test Wiki Compliance

Builds Releases Task Groups Packages Explorer

Search release definitions...

TFS - Prod Config Change | Edit

Overview Releases Deleted

1 2 3 4 5

Title	Environments	Build	Branch	Created	Created By	Description
Draft-2501	...			just now	Hitesh Sajani	
TFS - Prod Config Change 2358	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	2 hours ago	Joe Zhang (VSCS)	Add tarpitting exception for sp...
TFS - Prod Config Change 2357	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	7 hours ago	Pravai Agarwal	
TFS - Prod Config Change 2356	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	18 hours ago	Ritwik Saxena	
Draft-2497	...			18 hours ago	Ritwik Saxena	
TFS - Prod Config Change 2355	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	21 hours ago	Artur Ievsieiev	
TFS - Prod Config Change 2354	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	21 hours ago	Navneet Gupta	Disabling tracepoint collection f...
TFS - Prod Config Change 2353	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	22 hours ago	Artur Ievsieiev	
TFS - Prod Config Change 2352	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	22 hours ago	Navneet Gupta	[Itayoun] Enabling Tracepoint co...
TFS - Prod Config Change 2351	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	23 hours ago	Jeff Buswell	Fix State Constants for DTS #68...
TFS - Prod Config Change 2350	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	23 hours ago	Sam Sharifi	Enable limiting the number of t...
TFS - Prod Config Change 2349	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Tuesday	Sanyogita Ranade	Queue a retention job on MSEng
TFS - Prod Config Change 2348	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Tuesday	Tingluo Huang	2.107.1 to SBR1
TFS - Prod Config Change 2347	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Chandru Ramakri...	Disable RLS on tbl_DatabasePar...
TFS - Prod Config Change 2346	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Richard Mishan	Config Change to set SmtPass...
TFS - Prod Config Change 2345	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Dan Hellem	polaristest - increase attachme...
TFS - Prod Config Change 2344	✗ ...	VSO.Release.CI_M...	refs/heads/releas...	Monday	Hitesh Sajani	Enable AnalyticsTagDefinitionC...
TFS - Prod Config Change 2343	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Hitesh Sajani	Enabling AnalyticsWorkItemCh...
TFS - Prod Config Change 2342	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Tingluo Huang	
TFS - Prod Config Change 2341	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Dan Hellem	Walmart - process mapping for...
TFS - Prod Config Change 2340	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Kavipriya Adhinar...	
TFS - Prod Config Change 2339	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Kavipriya Adhinar...	
TFS - Prod Config Change 2338	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	Monday	Pavan Kumar Ade...	Enabling the auto SPN across al...
TFS - Prod Config Change 2337	✓ ✓ ✓ ✓ ✗	VSO.Release.CI_M...	refs/heads/releas...	10/7/2016	Rogan Ferguson	Turn on for and not rules on im...
TFS - Prod Config Change 2336	✓ ✓ ✓ ✓ ✓	VSO.Release.CI_M...	refs/heads/releas...	10/7/2016	Patrick Carnahan	Patch pri_GetBuilds on SUO

more releases...

TFS - Prod Config Change

1. Canary (internal users)
2. Smallest external data center
3. Largest external data center
4. International data centers
5. All the rest



# Kanban Board for Single Feature Crew

The screenshot displays a Kanban board within the Visual Studio Online interface. The board is organized into columns representing the workflow stages: Backlog, Ready, Investigate/Design, Development, Pull Request, Verification, and Done. Each column contains a list of work items, represented as cards. The cards are color-coded and include details such as titles, descriptions, priorities, and assignees. The board is currently set to the 'Ready' column, indicating the current sprint. The interface includes a sidebar with navigation options like 'Backlogs', 'Queries', 'Plans', and 'Estimate'. The Microsoft logo is visible in the bottom left corner.

Visual Studio Online / Blueprints

Backlogs Queries Plans Estimate My Activity State Visualizer

Stories

Backlog Ready Investigate/Design Development Pull Request Verification Done

Backlog

- Clear up the check of component version in SDK/SDK/Infrastructure
- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Ready

- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Investigate/Design

- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Development

- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Pull Request

- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Verification

- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Done

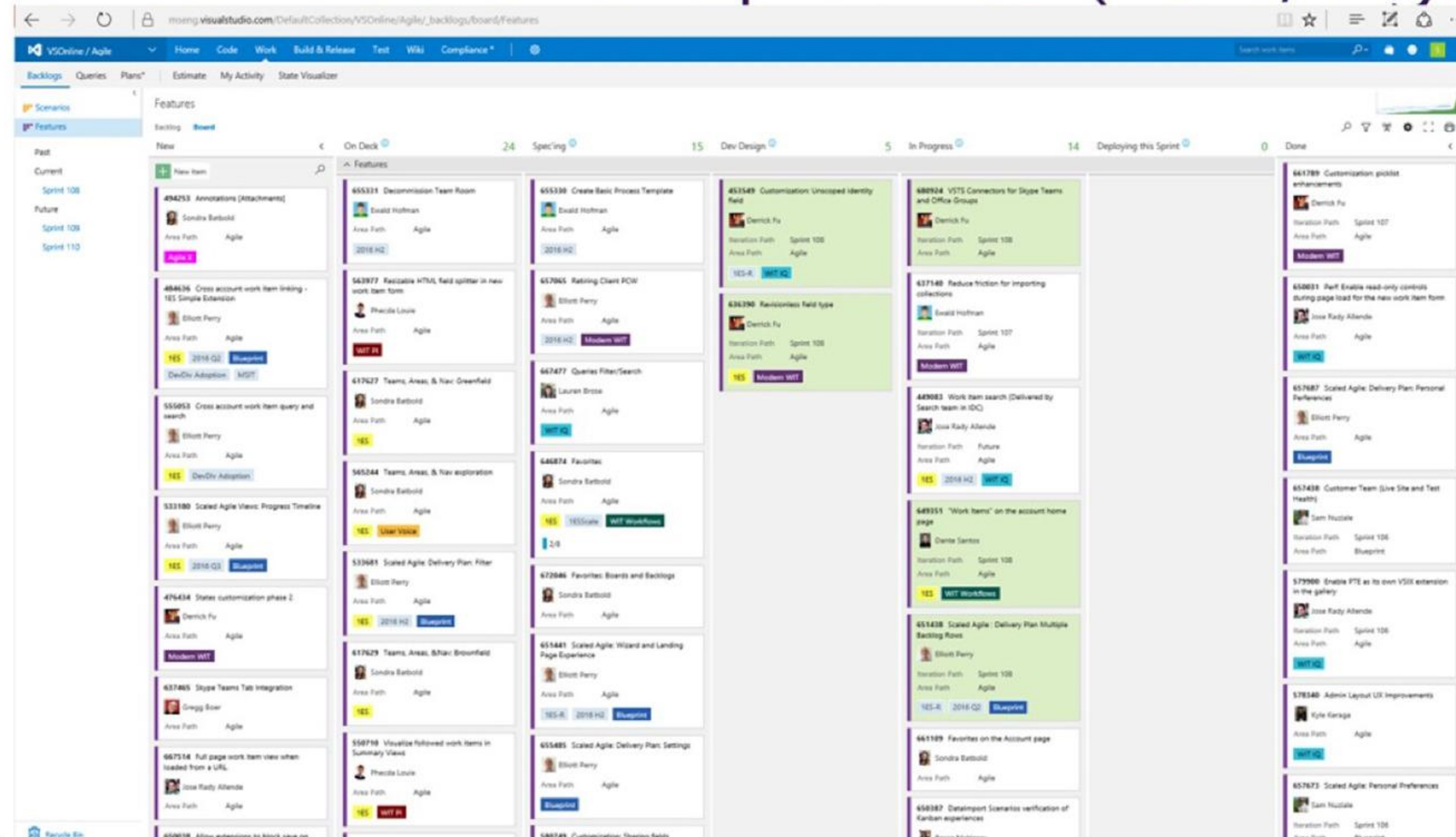
- Device Checkability
- Board Columns: Proposed
- SDK/SDK/Infrastructure
- SDK/SDK/Infrastructure

Microsoft

Defaults to  
current sprint



# Kanban Board for Epic Area (here, Agile)



All of these boards are customizable (swimlanes, columns, filters, etc.)



# My activity

mseng.visualstudio.com/DefaultCollection/VSOnline/\_apps/hub/ms-devlabs.vsts-extension-workitem-activities.workitem-activities-hub

VSOnline

Home Code Work Build & Release Test Wiki Compliance \*

Backlogs Queries Plans\* Estimate My Activity State Visualizer

Filter by workitem types

- ☒ Feature
- ☒ User Story
- ☒ DTS Task
- ☒ Bug
- ☒ Task
- ☒ Live Site Incident

View and access your most recently visited items.

- 486893 [Filtering] - Assigned to, Iteration path *visited* (10/12/2016 9:35:25 AM)
- 685296 DevOps Culture *visited* (10/10/2016 3:39:22 PM)
- 673909 DTS: Unable to use AAD groups - slb-sw.visualstudio.com *visited* (10/7/2016 10:48:01 AM)
- 650884 Notify window/containers change *visited* (10/6/2016 3:40:38 PM)
- 682927 refactor computed value in WIT module *visited* (10/6/2016 3:40:22 PM)
- 643915 Wrong redirect from https://azure.microsoft.com/en-us/services/application-insights/ *visited* (10/6/2016 2:09:51 PM)
- 571393 Rollis Royce (for WPC - July) *visited* (10/6/2016 2:09:36 PM)
- 682827 DevOps and Security *visited* (10/6/2016 2:08:16 PM)
- 672573 DevOps and Lean *edited* (10/5/2016 3:01:10 PM)
- 682771 DevOps and Cloud *visited* (10/5/2016 2:59:26 PM)
- 682772 DevOps and Containers *edited* (10/5/2016 2:59:15 PM)
- 670798 Documentation is too hard to find under Platforms *visited* (10/5/2016 2:58:53 PM)
- 667942 DevOps: What is DevOps? *visited* (10/5/2016 2:48:45 PM)
- 545225 [Board Filtering] Filter behavior on work item edits (via Board Refresh or explicit user action on the filtered board) *visited* (9/26/2016 1:47:04 PM)
- 508449 As a user, I should see toast notifications for any new updates done by someone else for my board. *visited* (9/26/2016 1:46:46 PM)
- 667932 DevOps: Continuous Integration : Opening Statements *visited* (9/23/2016 10:18:30 AM)
- 668627 DevOps: Monitoring : Tutorial *visited* (9/23/2016 10:12:49 AM)
- 655513 DevOps: What is Continuous Integration? *visited* (9/23/2016 10:12:06 AM)
- 662749 As a part of rich CC browsing experience, allow styles to be shown in CC report *visited* (9/22/2016 3:27:28 PM)
- 655469 What is Agile? *visited* (9/22/2016 2:59:56 PM)
- 666341 DevOps - Continuous Integration *visited* (9/22/2016 2:59:22 PM)
- 667931 DevOps: Continuous Delivery : Opening Statements *visited* (9/22/2016 2:58:43 PM)
- 663037 Processes are not appearing project list *visited* (9/22/2016 7:10:29 AM)
- 662985 VSTF - Multiple Instance Outages Due to LUN Deletio *visited* (9/19/2016 11:53:40 AM)
- 665081 Incident Notification: Investigating issues with Releases in Microsoft.VisualStudio.Com *visited* (9/19/2016 11:53:07 AM)
- 647475 Sonatype (Nexus product line) *visited* (9/19/2016 11:50:13 AM)
- 656959 Repo picker always visible in L1 nav *visited* (9/19/2016 11:24:37 AM)





# Tiny Continuous Merging

Everyone is on ONE main master branch

Git helps with lightweight topic branching

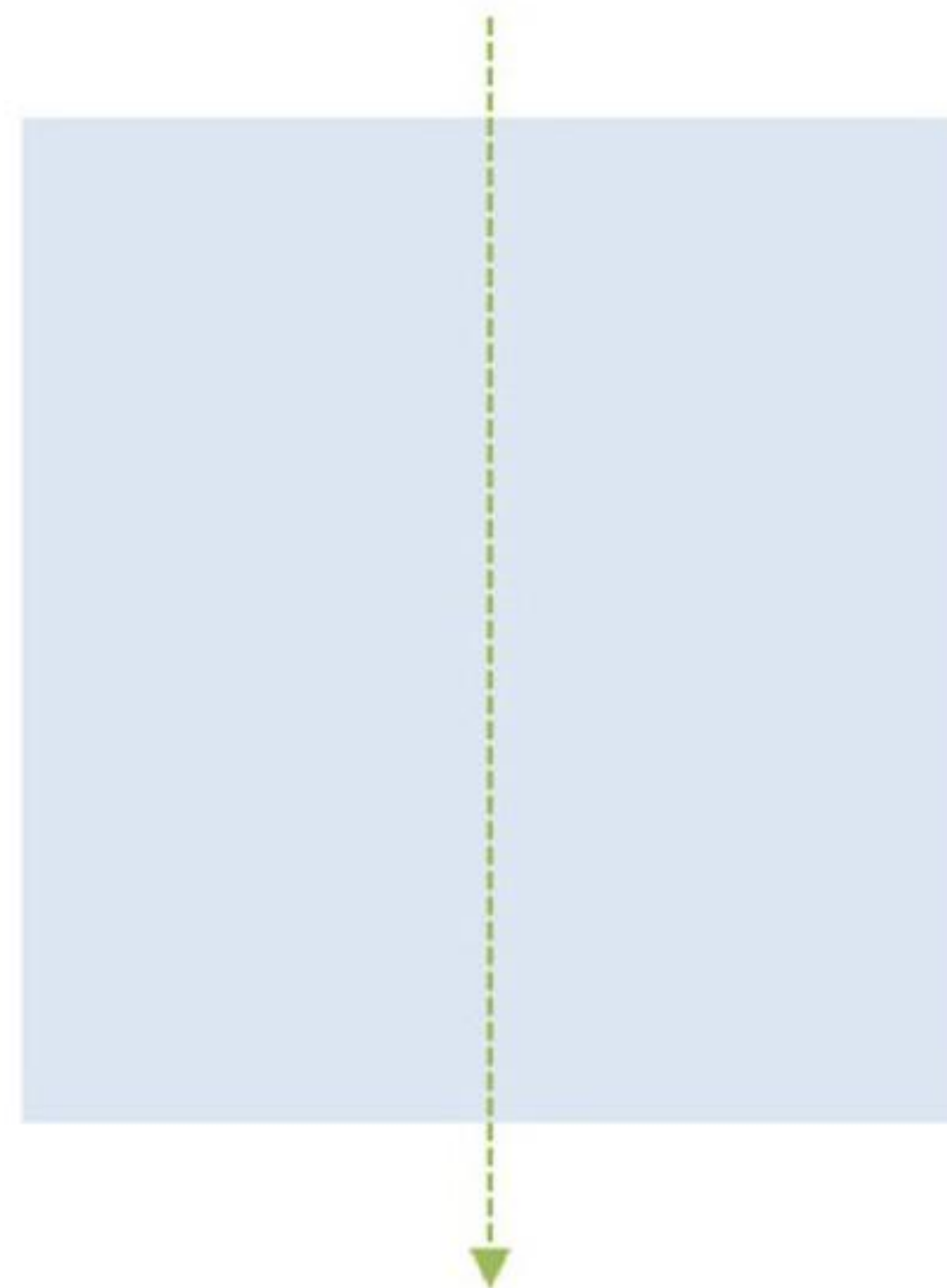
Code is fresh in your mind





# Feature Flags

All code is deployed, but feature flags control exposure

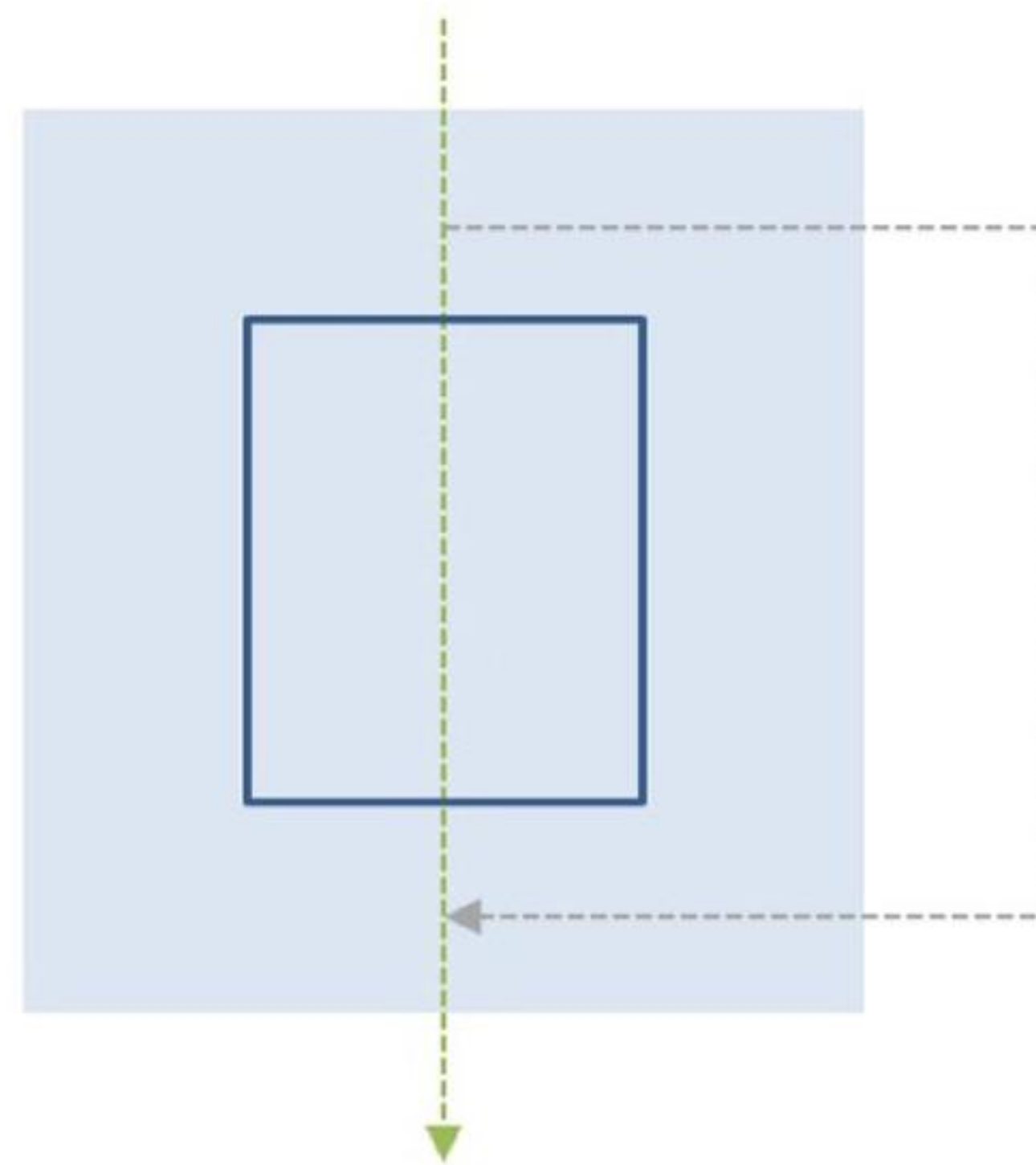




Feature  
Flag

ON

OFF

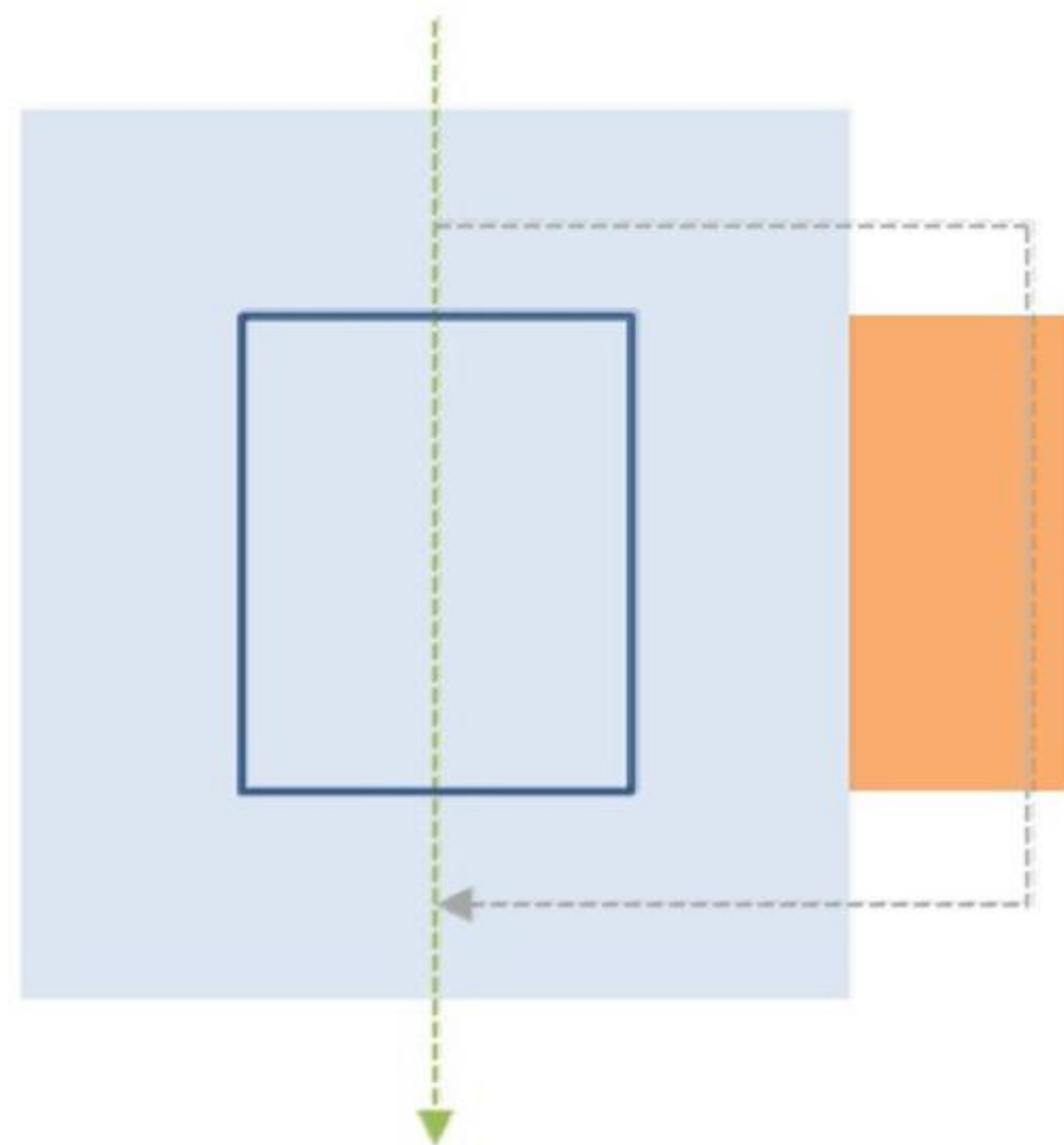




Feature  
Flag

ON

OFF

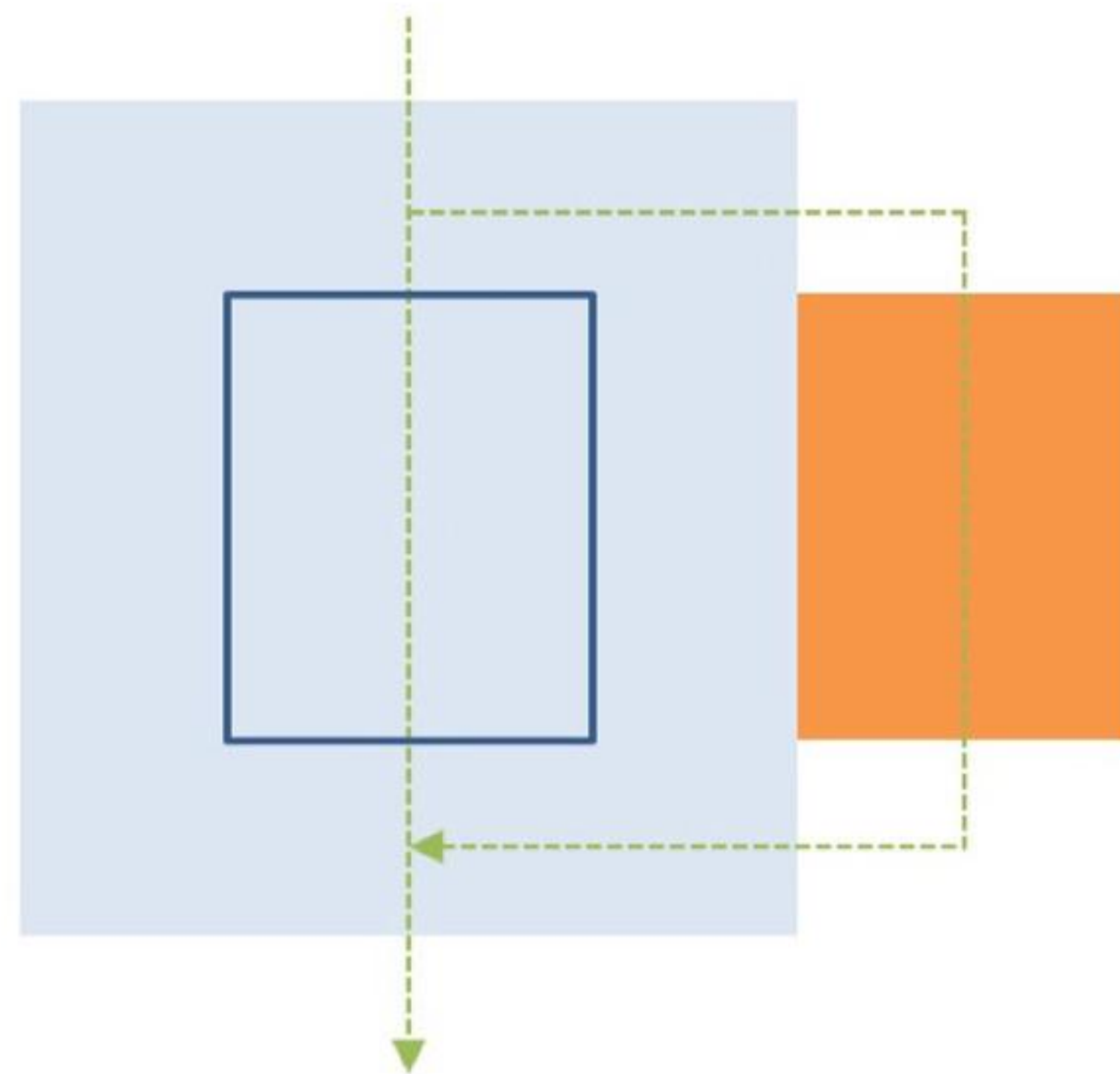




Feature  
Flag

ON

OFF

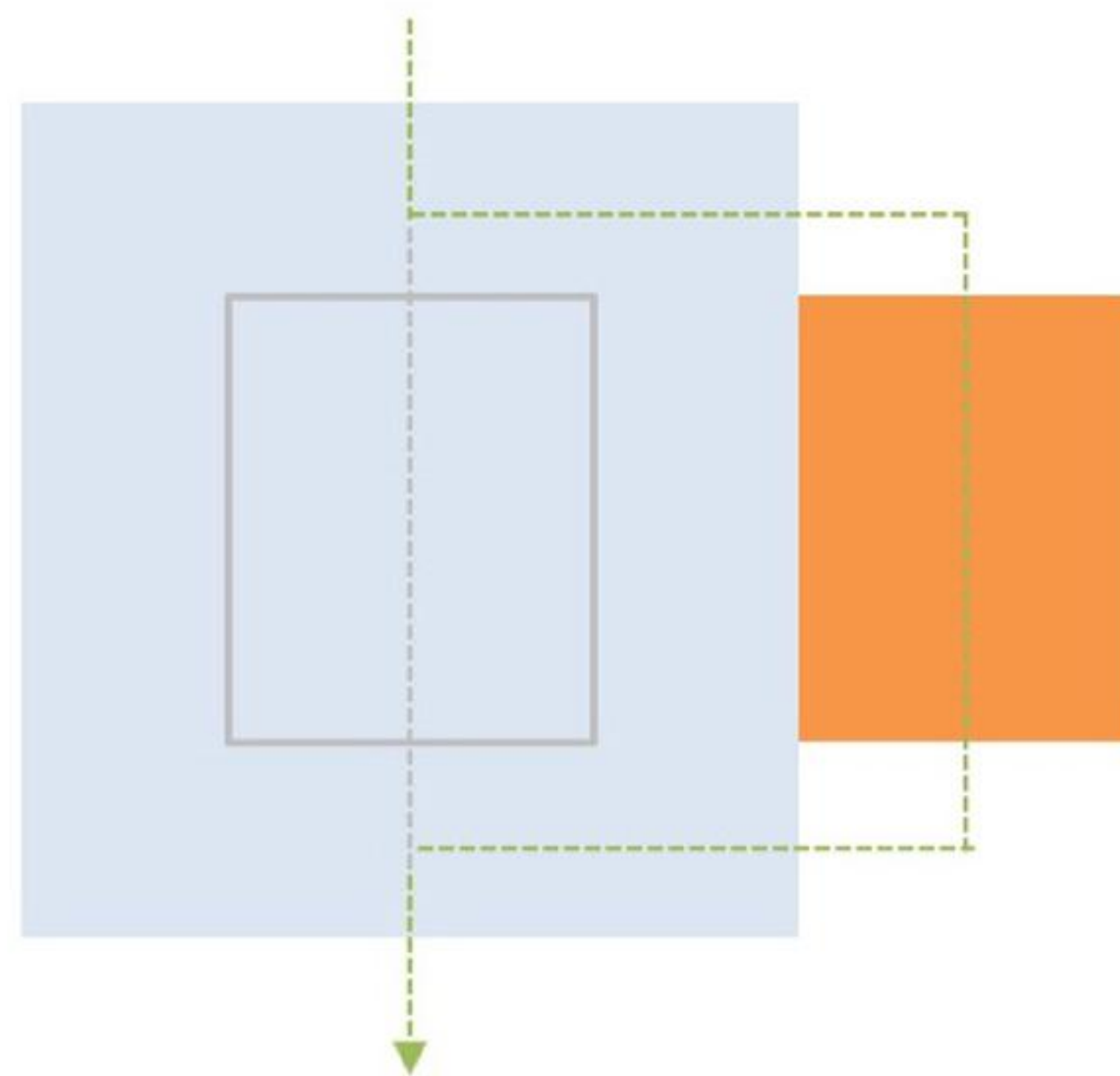




Feature  
Flag

ON

OFF

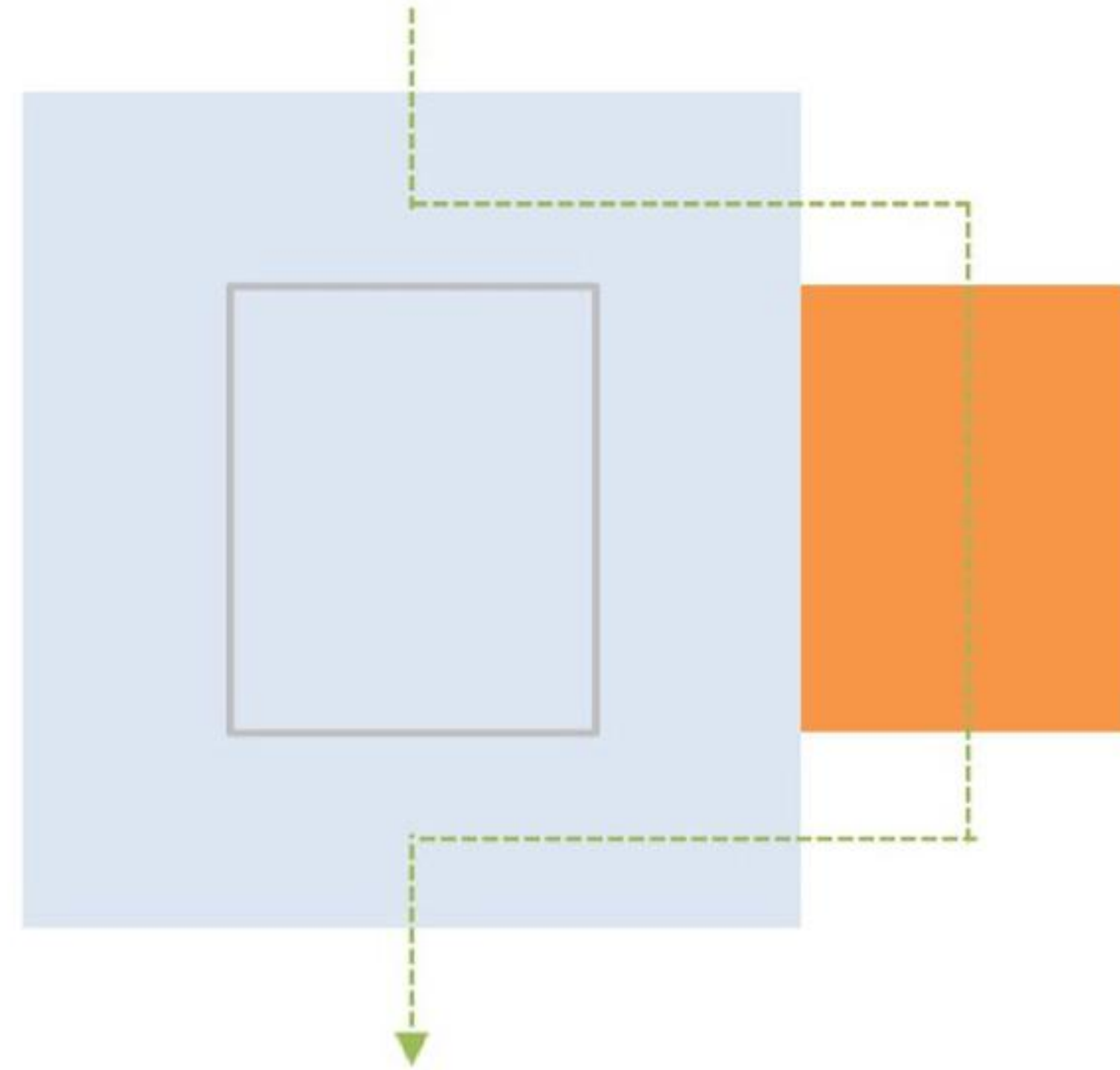




Feature  
Flag

ON

OFF

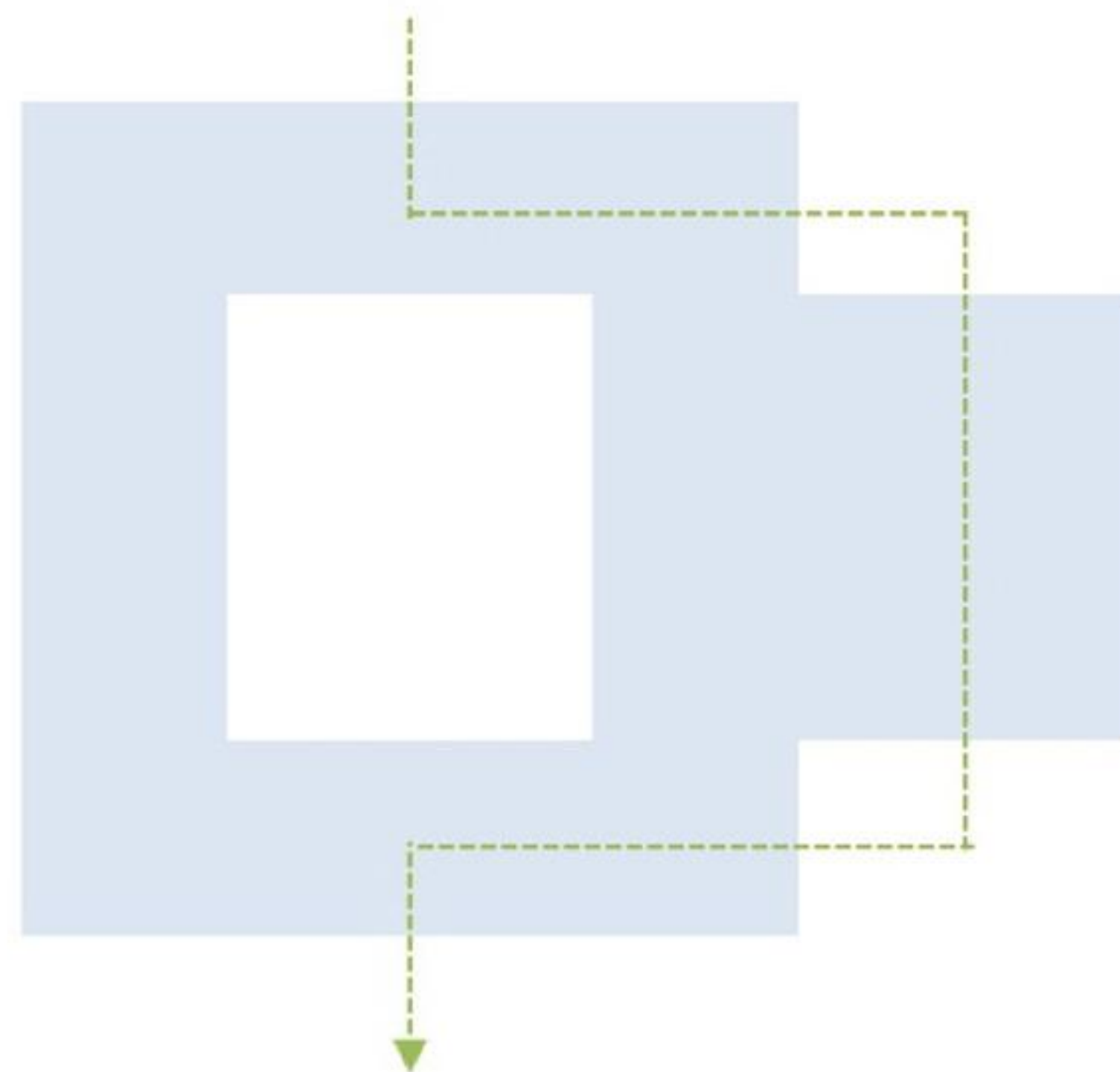




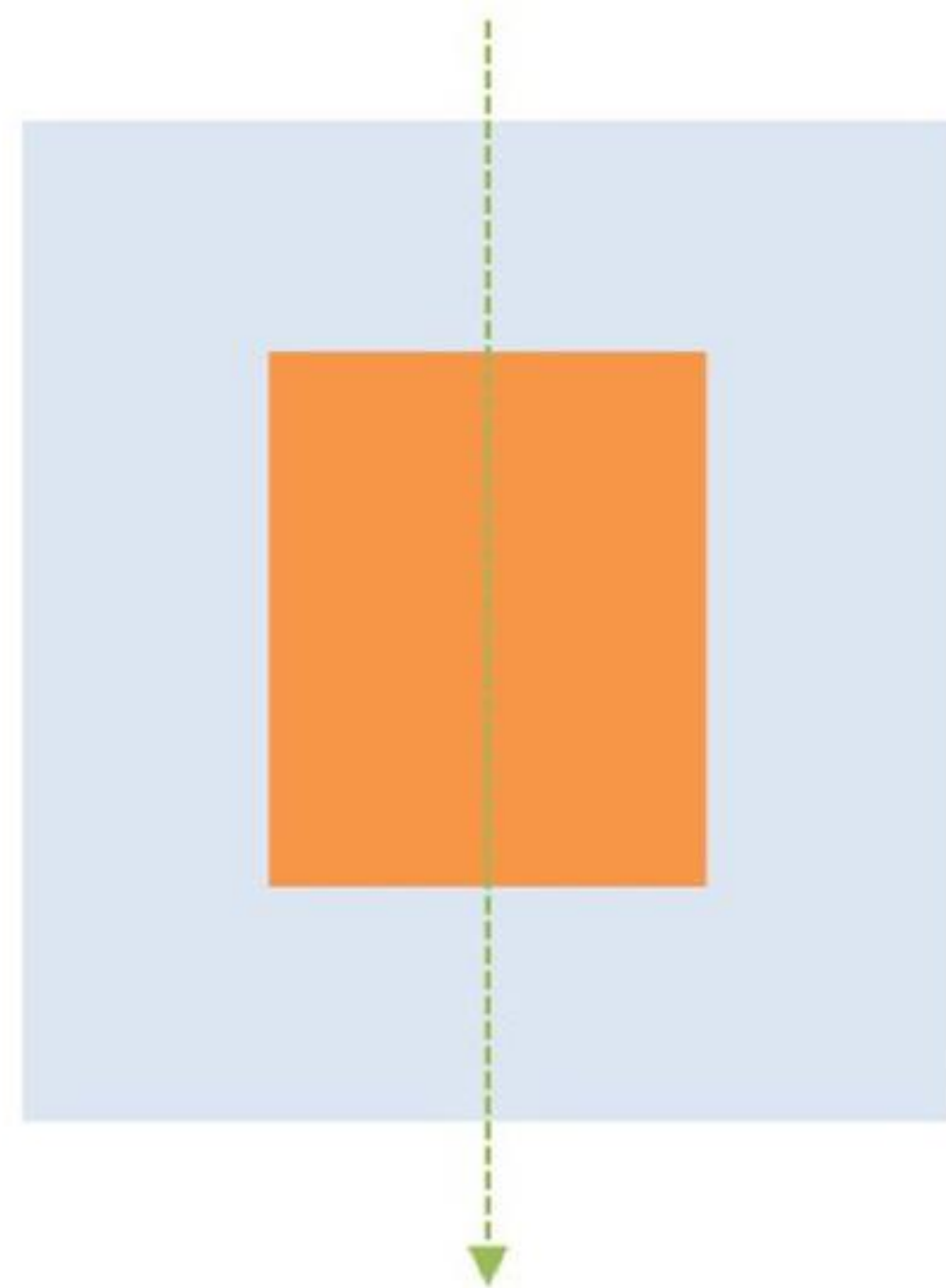
Feature  
Flag

ON

OFF





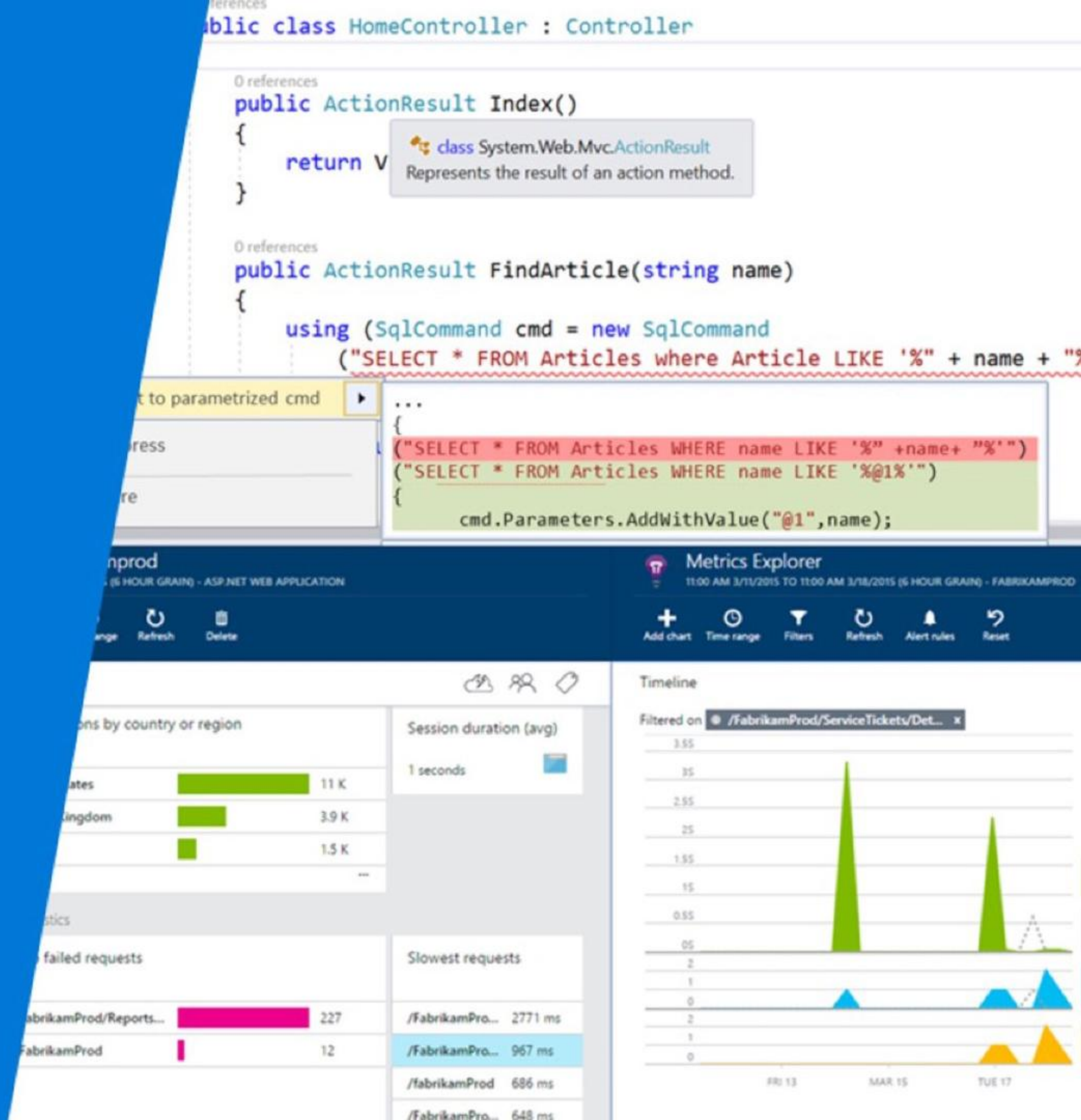




# Evolving DevOps

Continuous Integration +  
Real-time experiences =  
Shift Left

Continuous data mining +  
near real-time data =  
Shift Right





# Live Site Culture and Engineering

Livesite Health					Engineering Debt				
# LSI repair WIs older than 2 sprints	% LSI repair WIs completed within 2 sprints	# of DTSs over SLA	% Perf Scenarios within SLA		# of P0 or P1 bugs older than 21 days	# of Active bugs per engineer	# of Security WIs older than 21 days	DevFabric L2 SelfTest & SelfHost Reliability	# of Cloud TRA Tests
0	N/A	0	0		1	3	1	100 (2/2)	0
0	100	0	N/A		0	2	0	91 (61/67)	2036
0	N/A	0	0		1	3	0	100 (46/46)	0
0	N/A	0	N/A		0	2	0	88 (7/8)	0
0	100	0	0		0	2	0	98 (59/60)	0

## Live Site Health

Time to Detect  
 Time to Communicate  
 Time To Mitigate  
 Customer Impact  
 Incident prevention items  
 Aging live site problems  
 Customer support metrics  
 SLA per customer account



## Velocity

Time to build  
 Time to self test  
 Time to deploy  
 Time to learn  
 (Telemetry pipe)

## Engineering

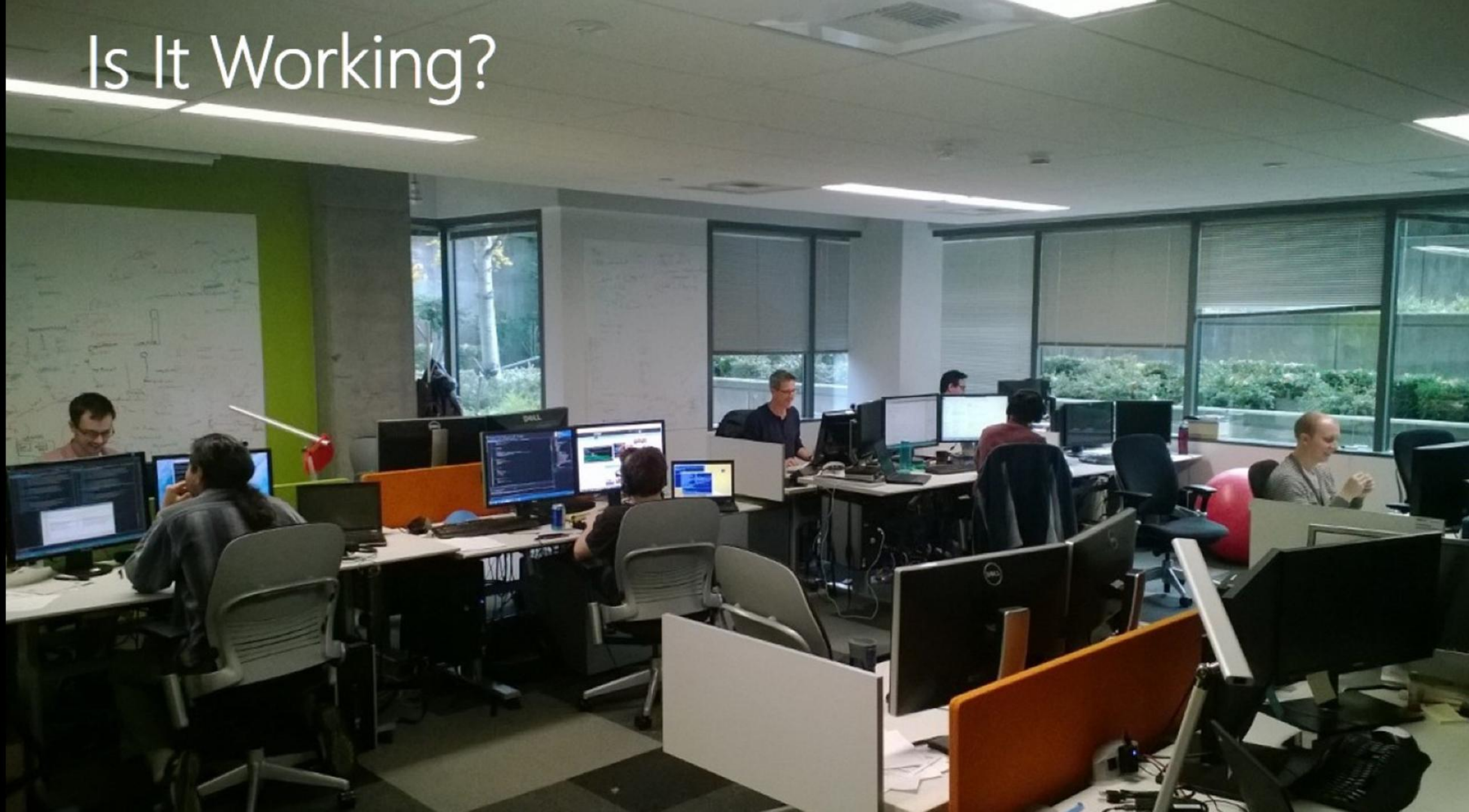
Bug cap per engineer  
 Aging bugs in important categories  
 Pass rate & coverage by test level

## Usage

Acquisition  
 Engagement  
 Dedication  
 Churn  
 Feature usage

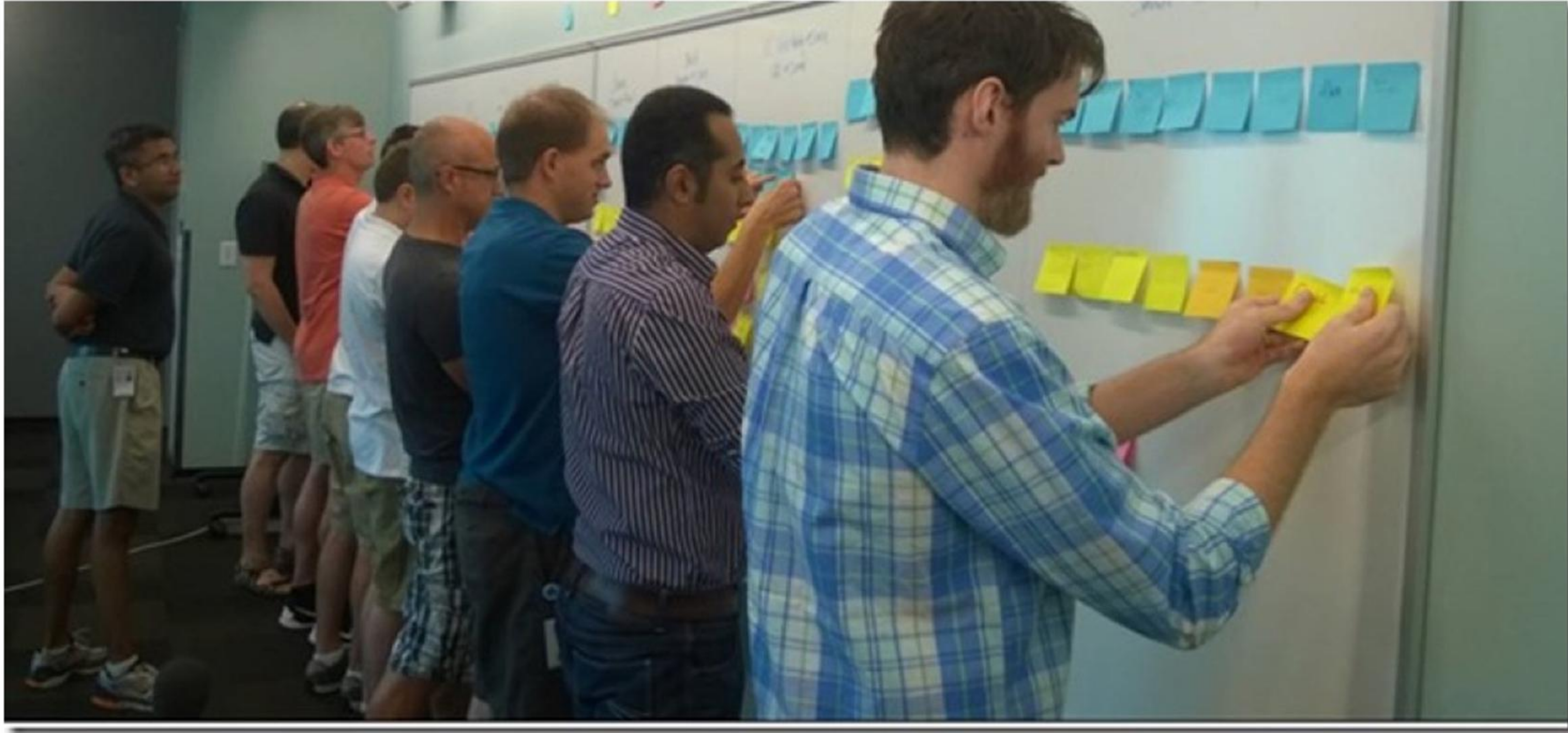


Is It Working?





# Self-forming teams



<https://aka.ms/SelfFormingTeams>



# Is 1ES Working?

4x active user growth in 2 years to 62,000



