



Microservices

In Practices with Java Technology





Somkiat Puisungnoen

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Public Post

Intro

Software Craftsmanship

Software Practitioner at สยามชั่นนาฎกิจ พ.ศ. 2556

Agile Practitioner and Technical at SPRINT3r

Somkiat Puisungnoen 15 mins · Bangkok · ...

Java and Bigdata



somkiat.cc

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Agenda Day 1

1. Cloud Native Application
2. Microservices and DevOps
3. The architecture of Microservices
4. How to model Microservices
5. Integrating multiple Microservices
6. Developing Microservices with Java
7. Workshop



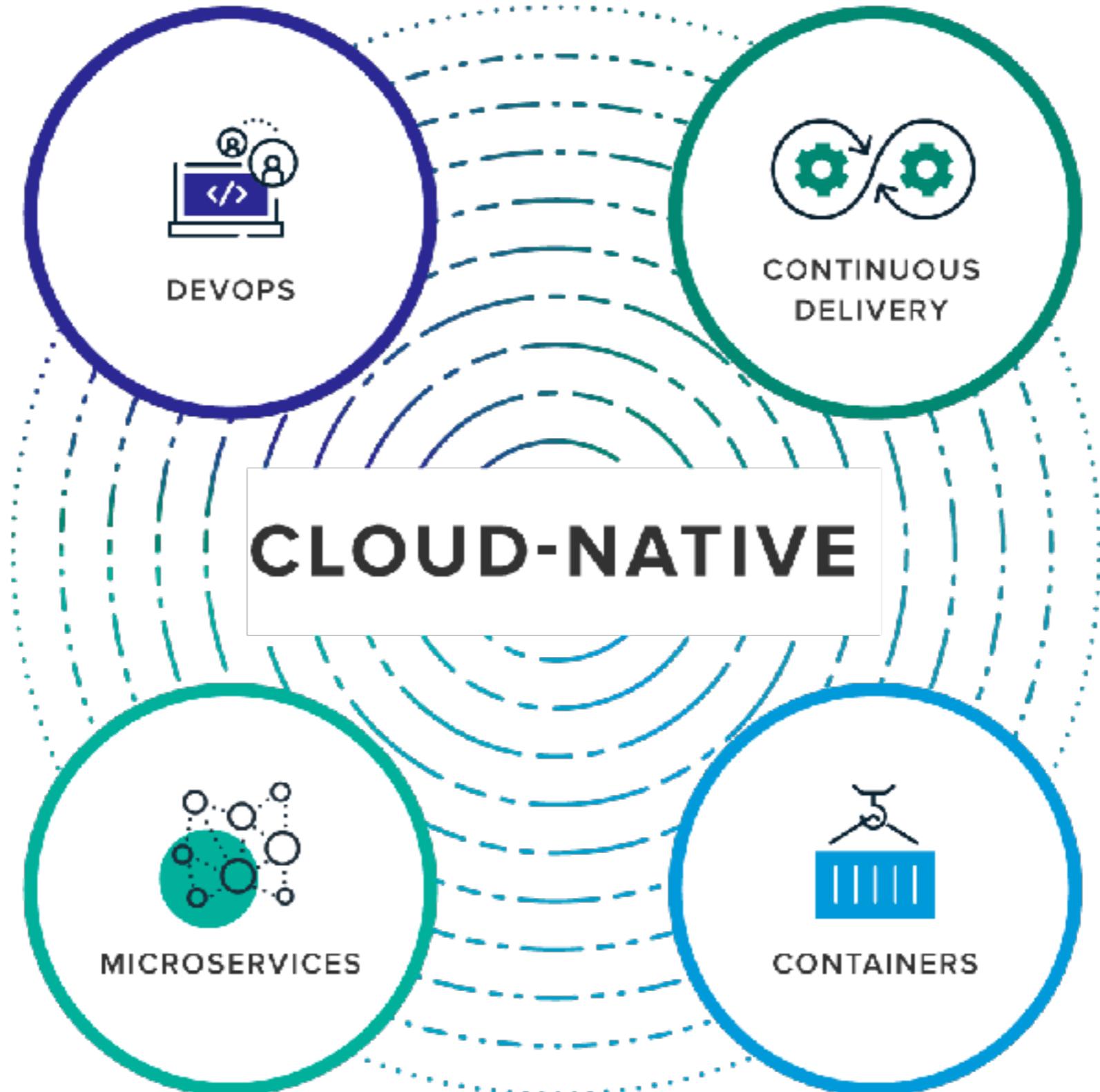
Agenda Day 2

1. Testing Microservices
2. Deploying Microservices
3. Maintaining healthy Microservices
4. Monitoring Microservices
5. Scaling up your Microservices
6. Workshop
7. Agile model



<https://github.com/up1/course-microservice>





<https://pivotal.io/cloud-native>

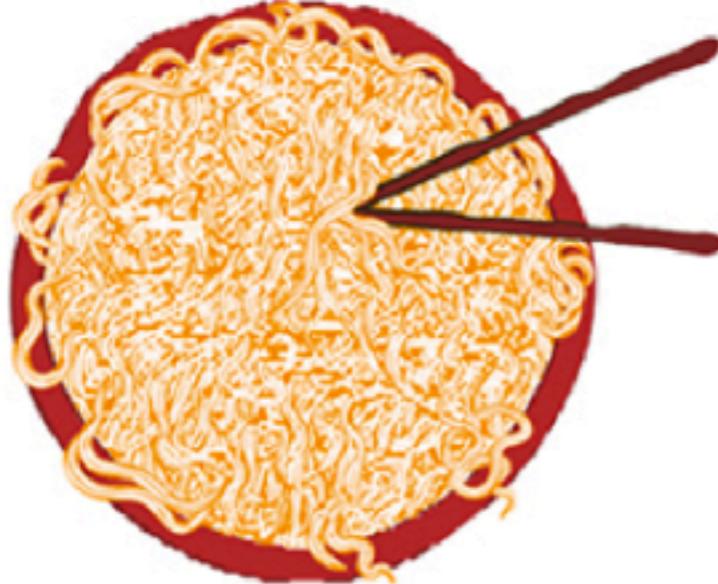


Evolution of Architecture



1990s and earlier

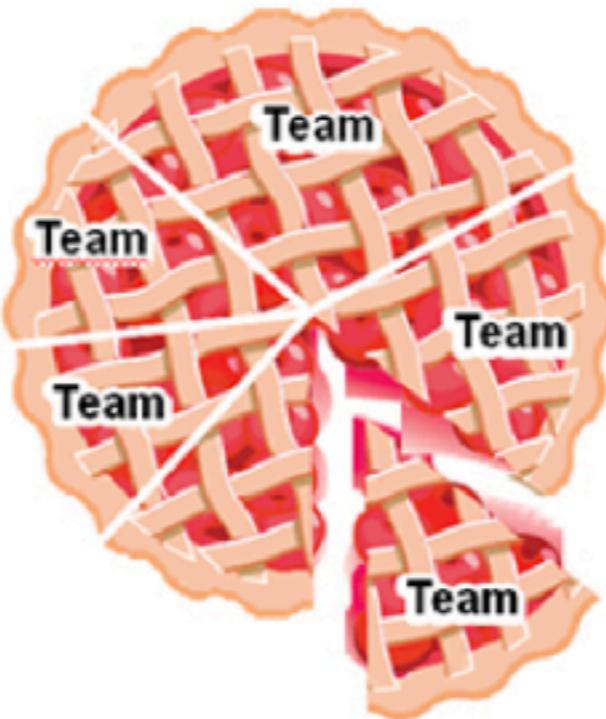
Pre-SOA (monolithic)
Tight coupling



For a monolith to change, all must agree on each change. Each change has unanticipated effects requiring careful testing beforehand.

2000s

Traditional SOA
Looser coupling



Elements in SOA are developed more autonomously but must be coordinated with others to fit into the overall design.

2010s

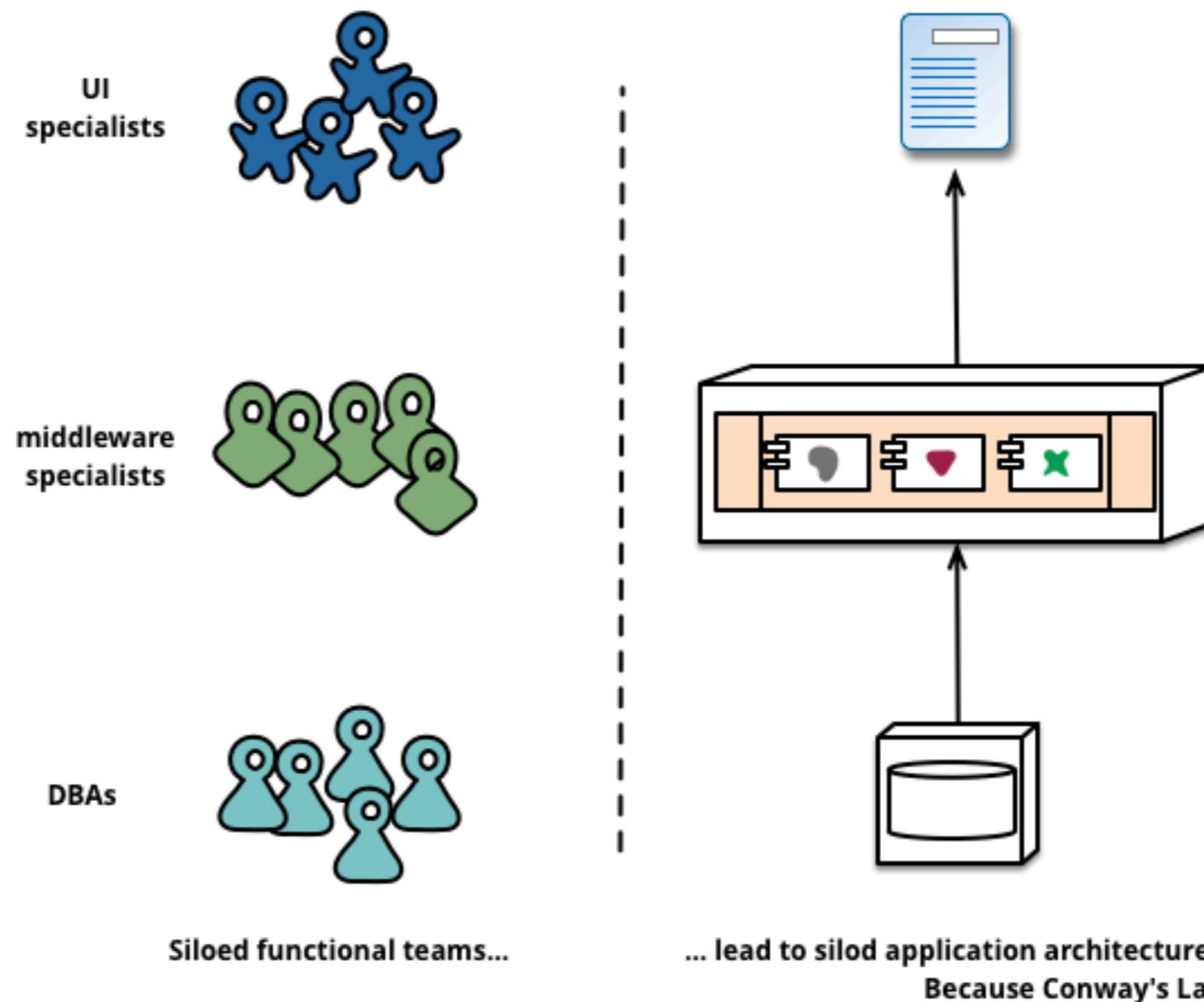
Microservices
Decoupled



Developers can create and activate new microservices without prior coordination with others. Their adherence to MSA principles makes continuous delivery of new or modified services possible.



Conway's Law



Microservices

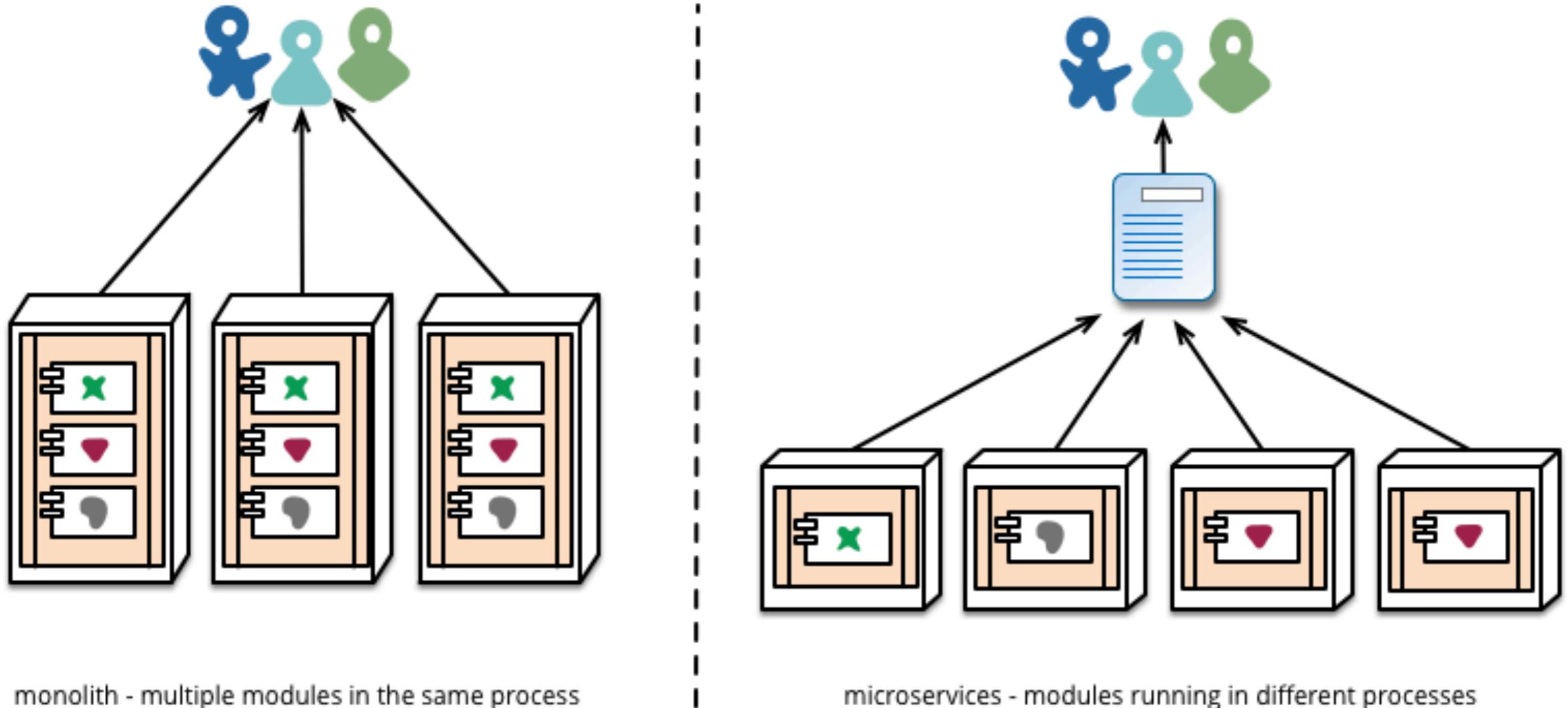


Microservices

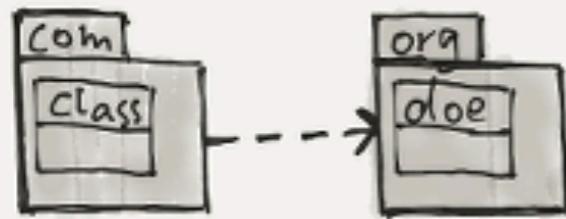
Small, Do one thing
Modular
Easy to deploy
Scale independently



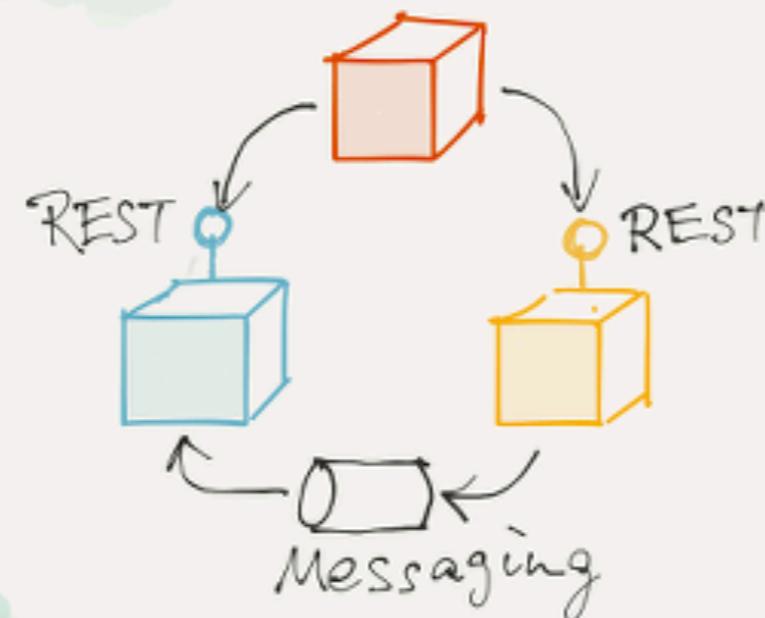
Conway's Law



Architecture



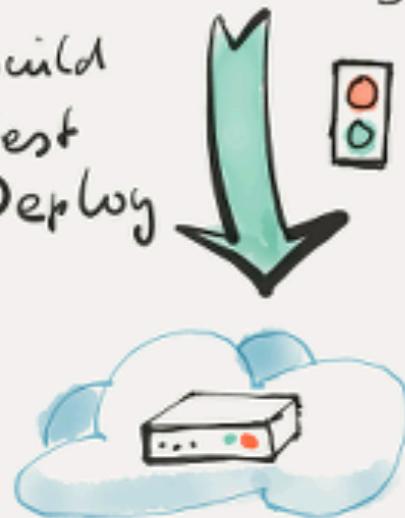
Microservices



Deployment

Continuous Delivery

`{ var i=1; }`
Build
Test
Deploy



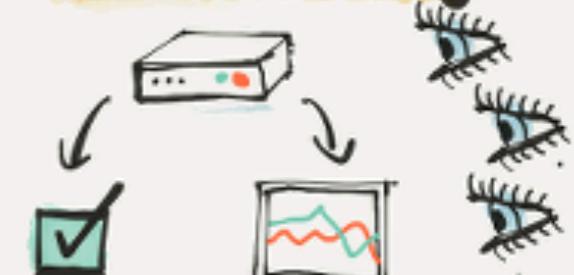
Infrastructure



People & Teams



Monitoring



Features & Technology

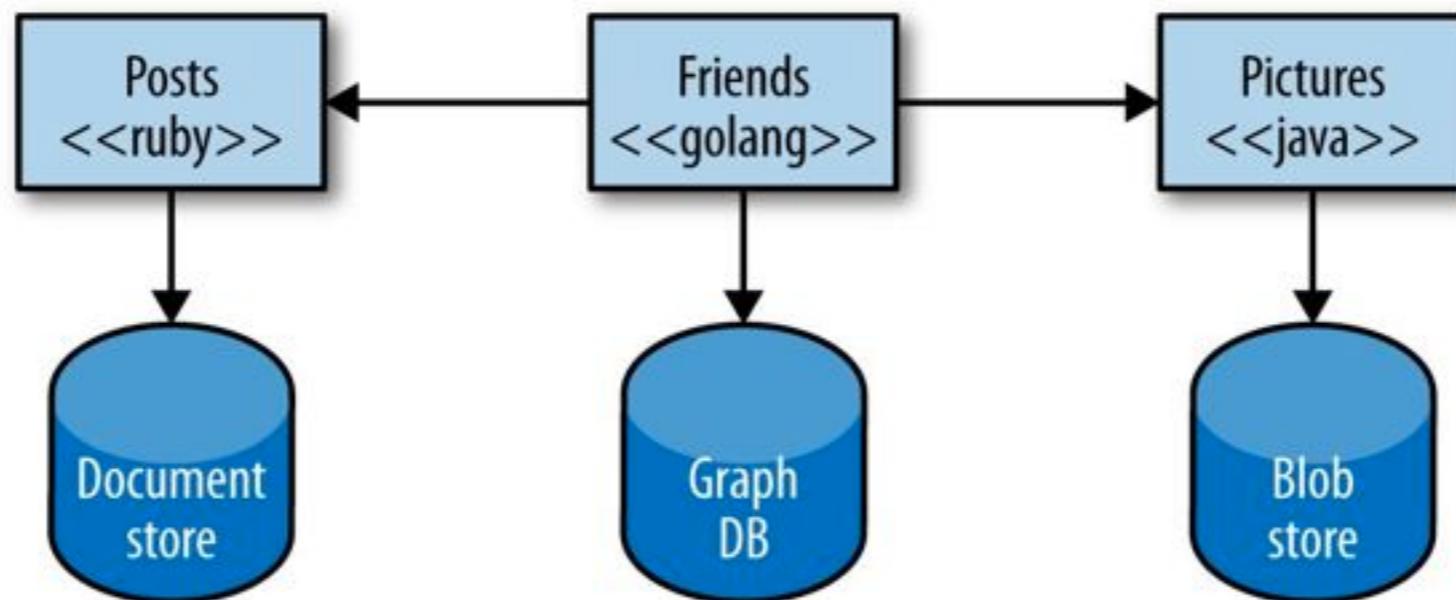


Key Benefits

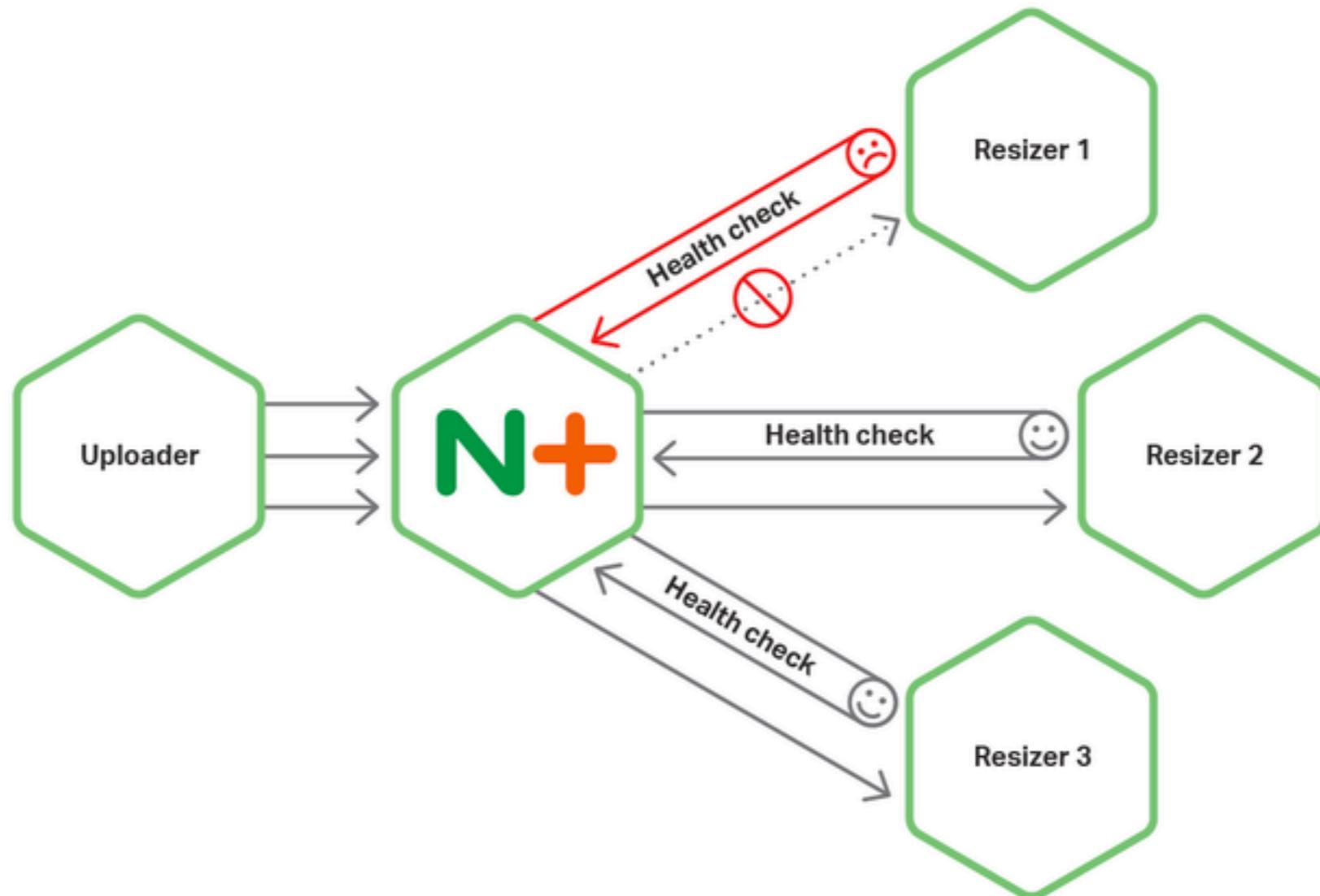


1. Technology heterogeneity

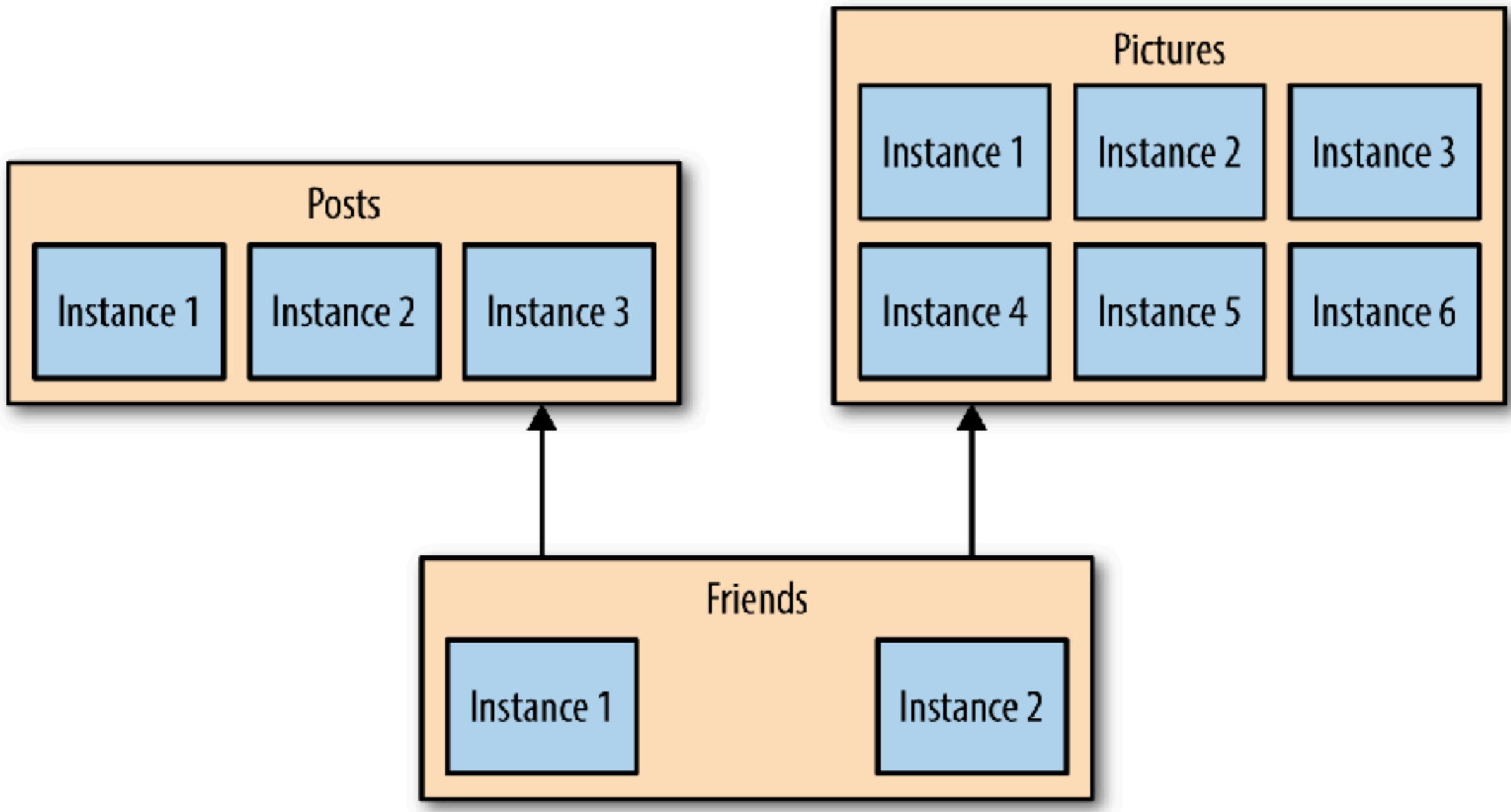
The right tool for each job



2. Resilience

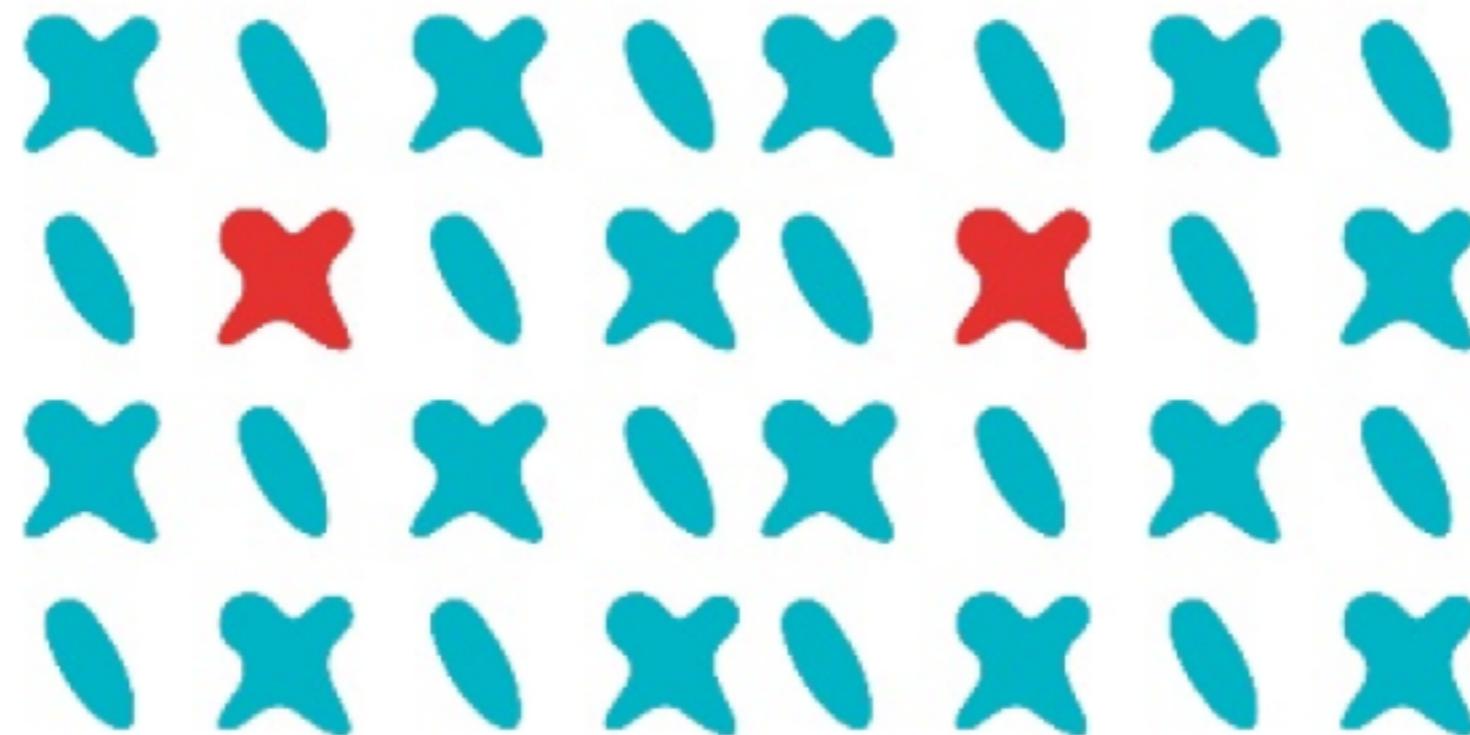


3. Scaling



4. Ease of deployment

Deploys are faster, independent and problems can be isolated more easily

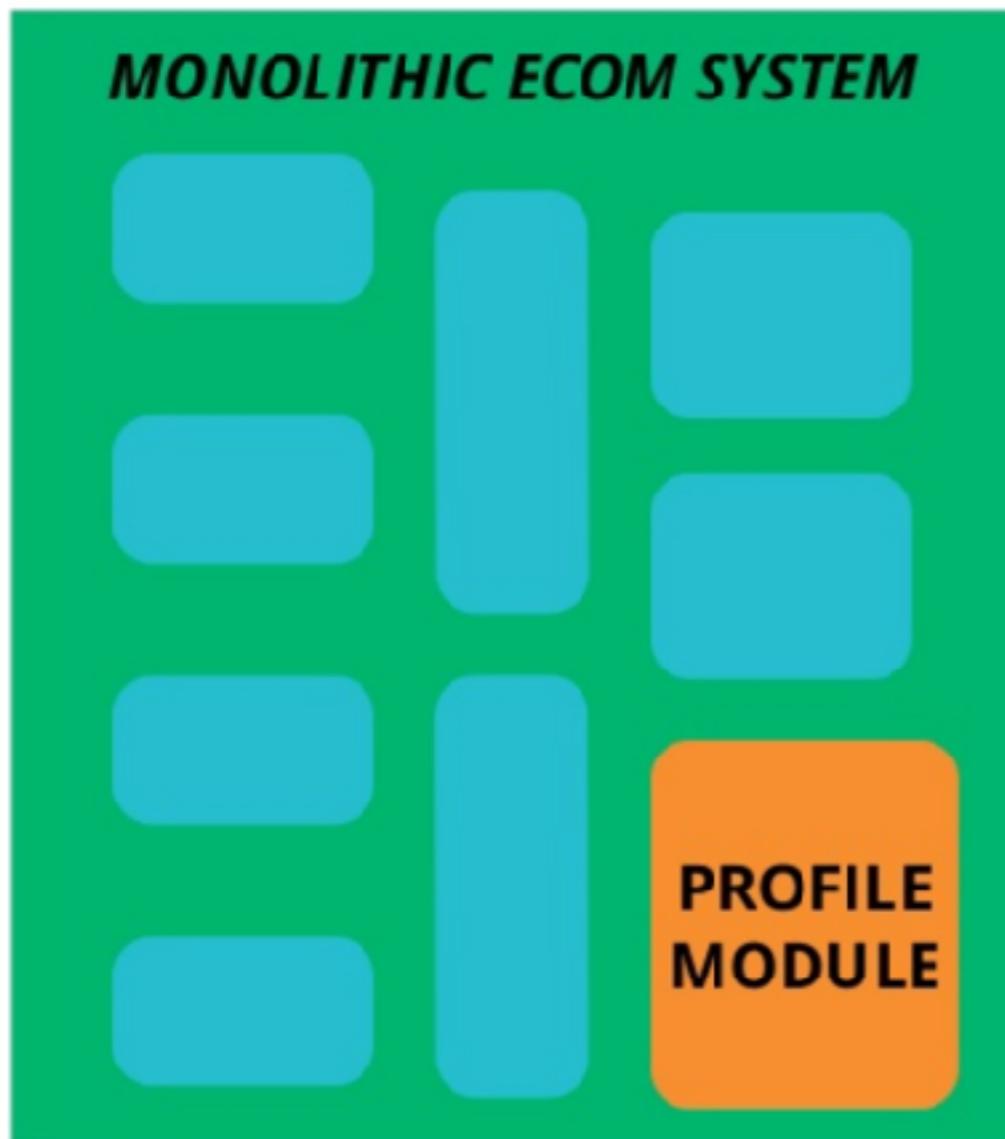


5. Organization alignment

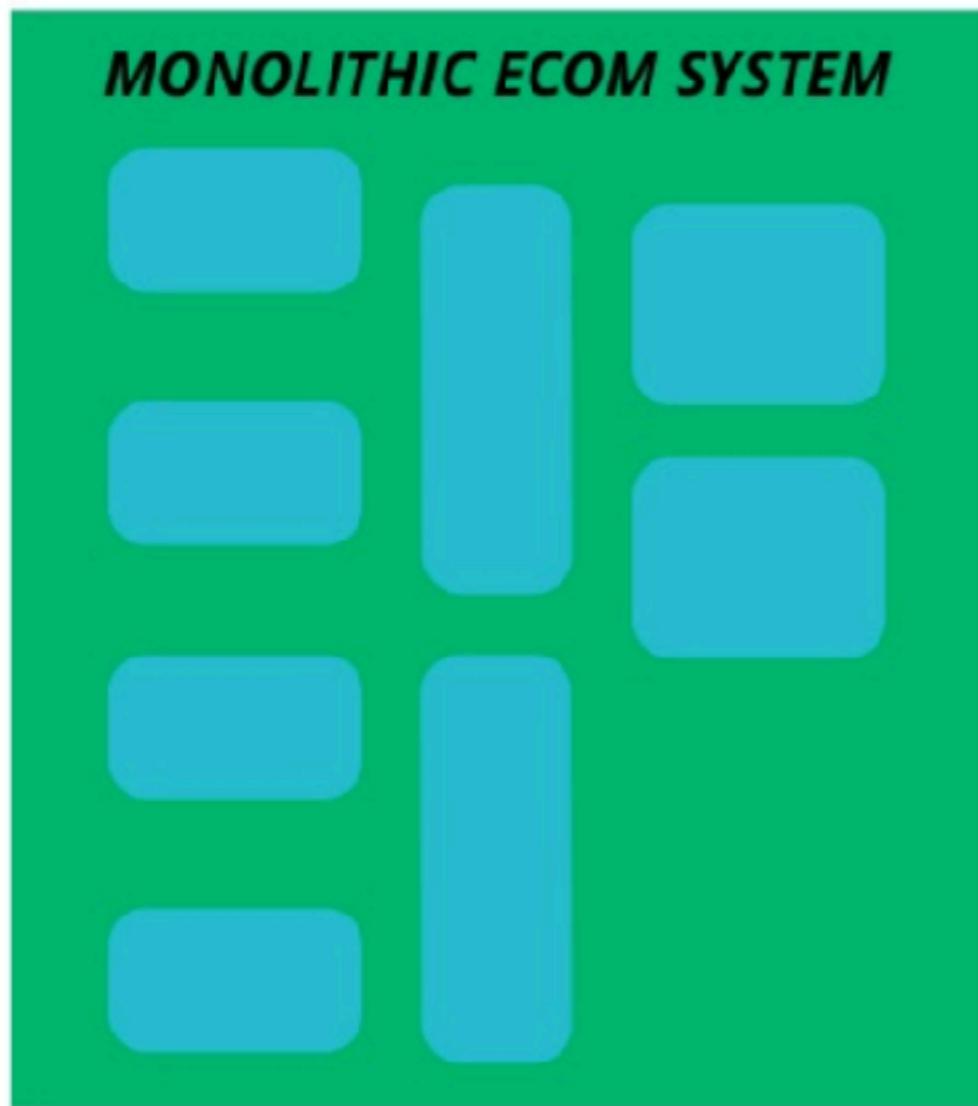
Small teams and smaller codebases



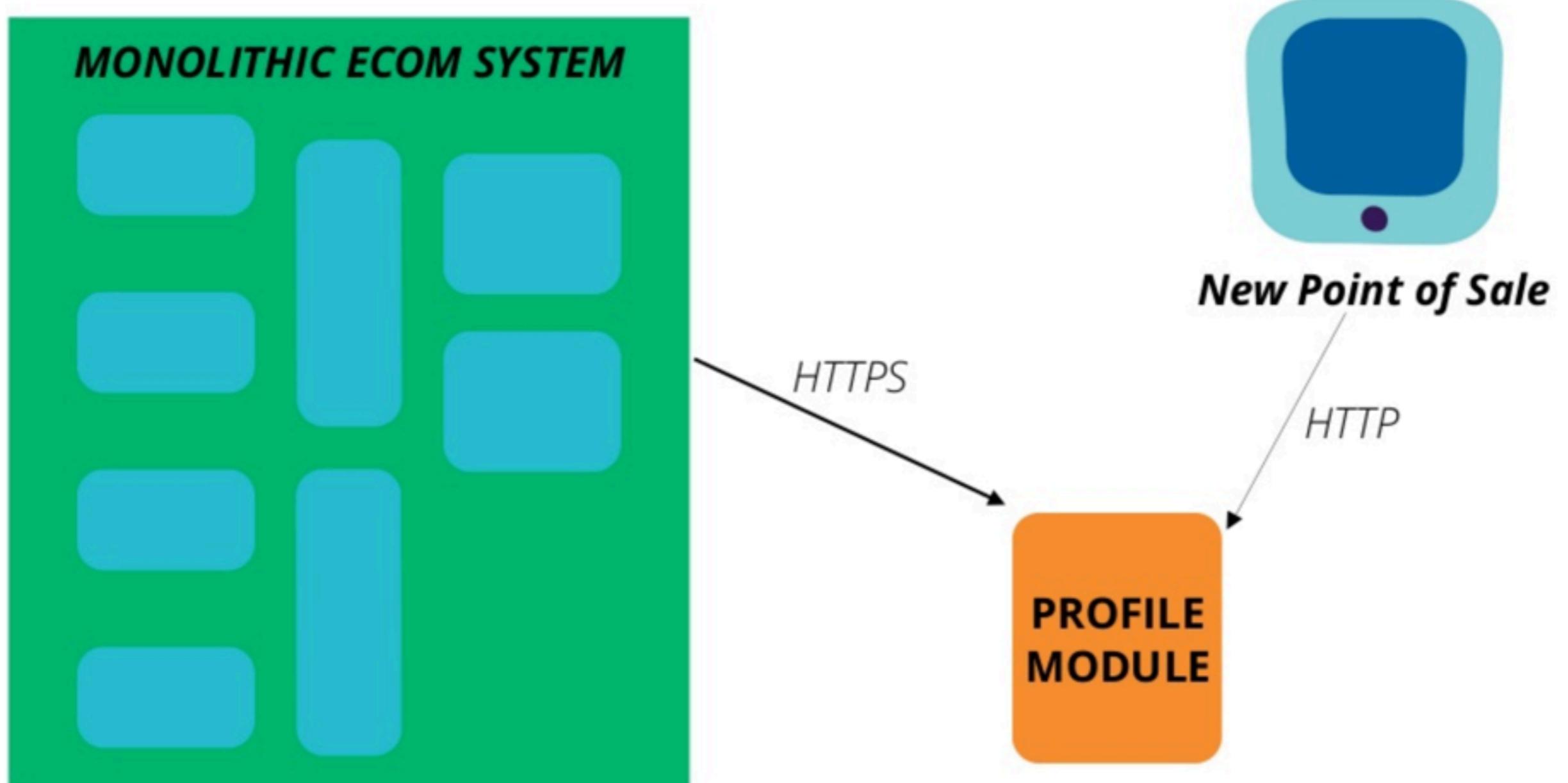
6. Composability and replaceability



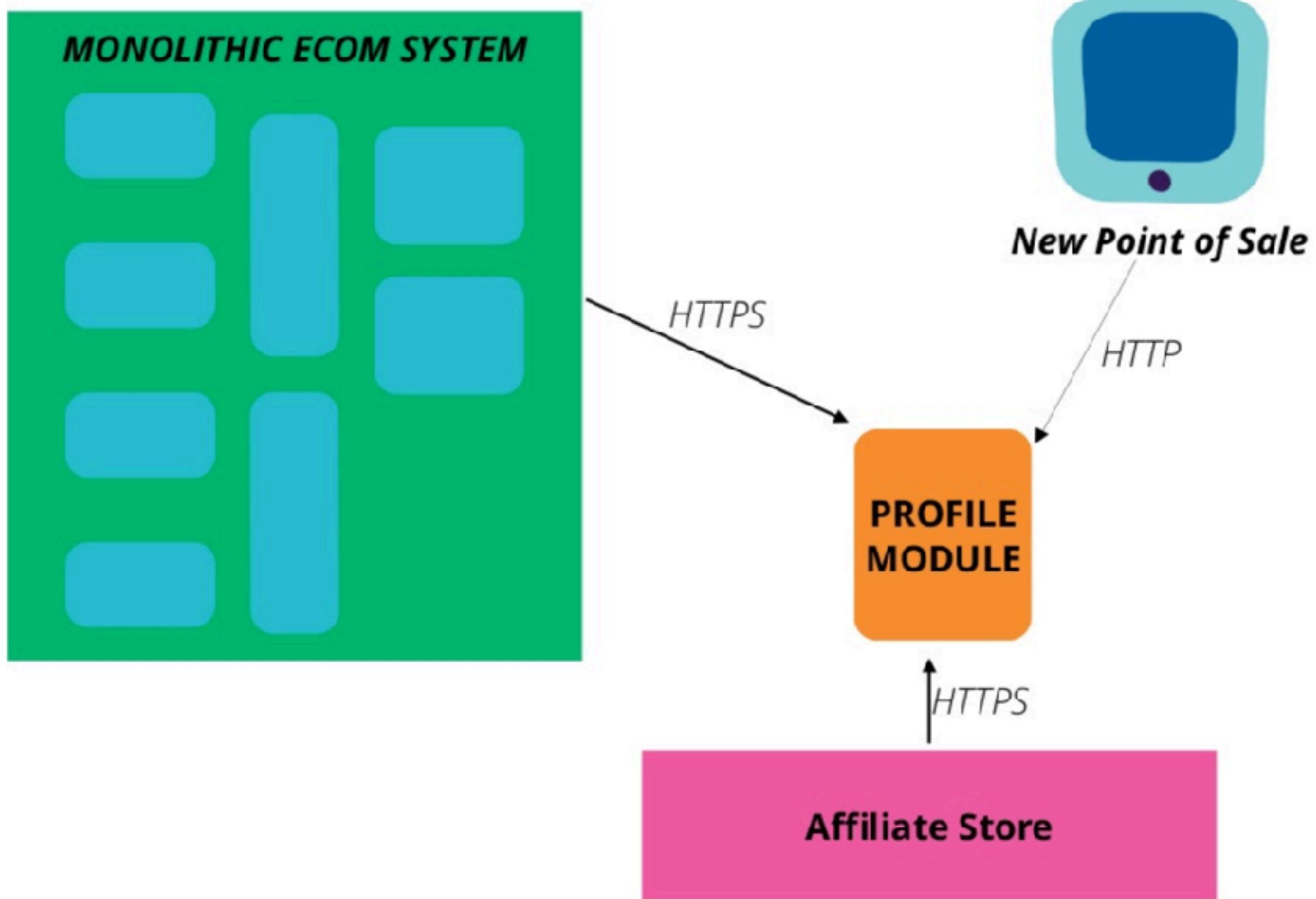
6. Composability and replaceability



6. Composability and replaceability



6. Composability and replaceability



Characteristics



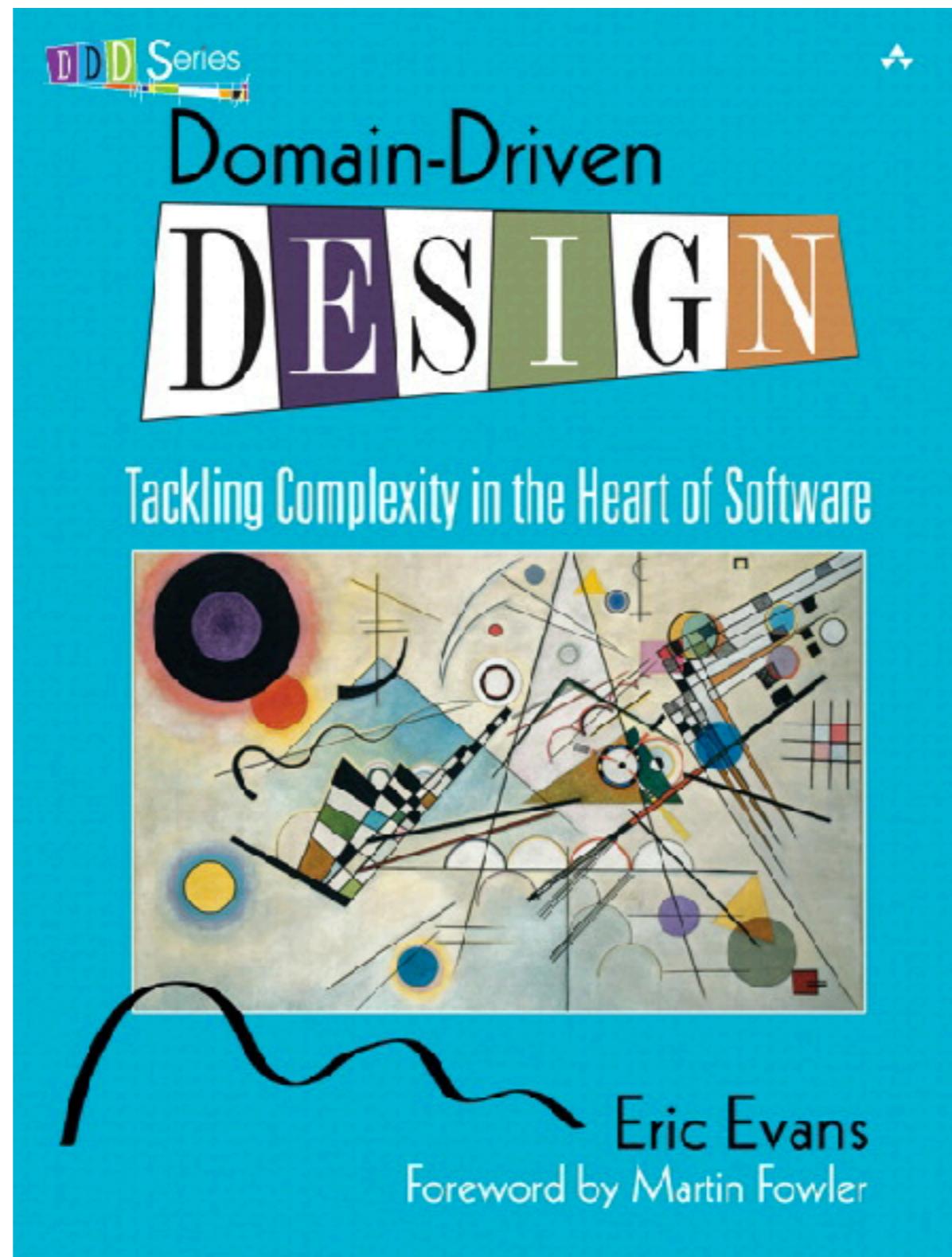
1. Responsible for a single capability



Types of capabilities

Business capability
Technical capability





2. Individually deployable



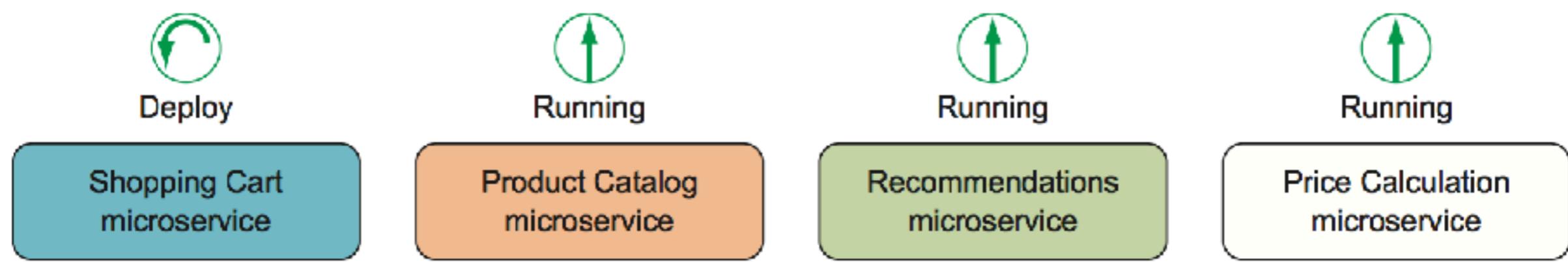


Figure 1.2 Other microservices continue to run while the Shopping Cart microservice is being deployed.



3. Consists of one or more processes



**Problematic process boundary.
Microservices should run in separate
processes to avoid coupling.**

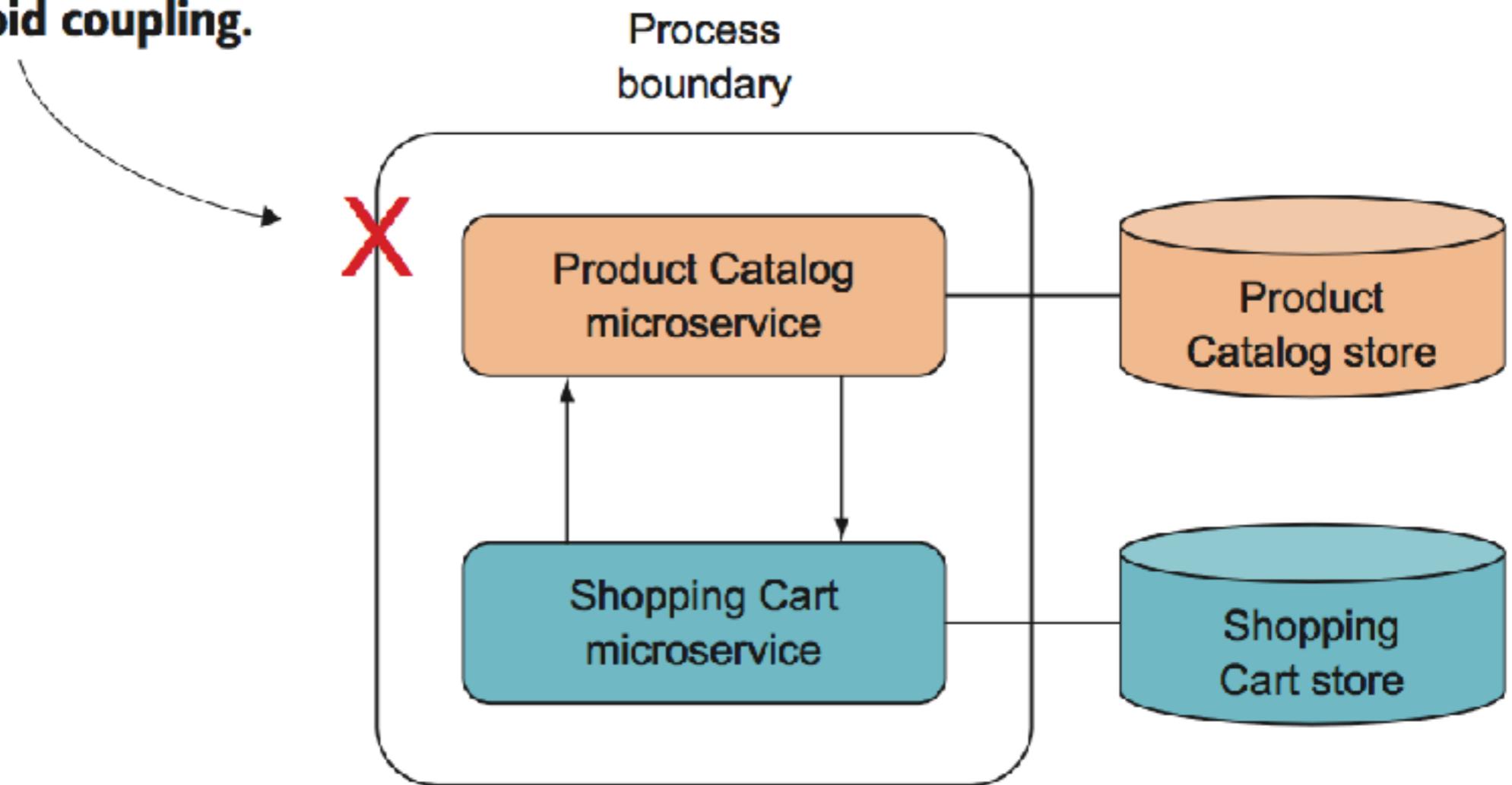


Figure 1.3 Running more than one microservice within a process leads to high coupling.



4. Own data store



All communication with the Product Catalog microservice must go through the public API.

Direct access to the Product Catalog store is not allowed. The Product Catalog microservice owns the Product Catalog store.

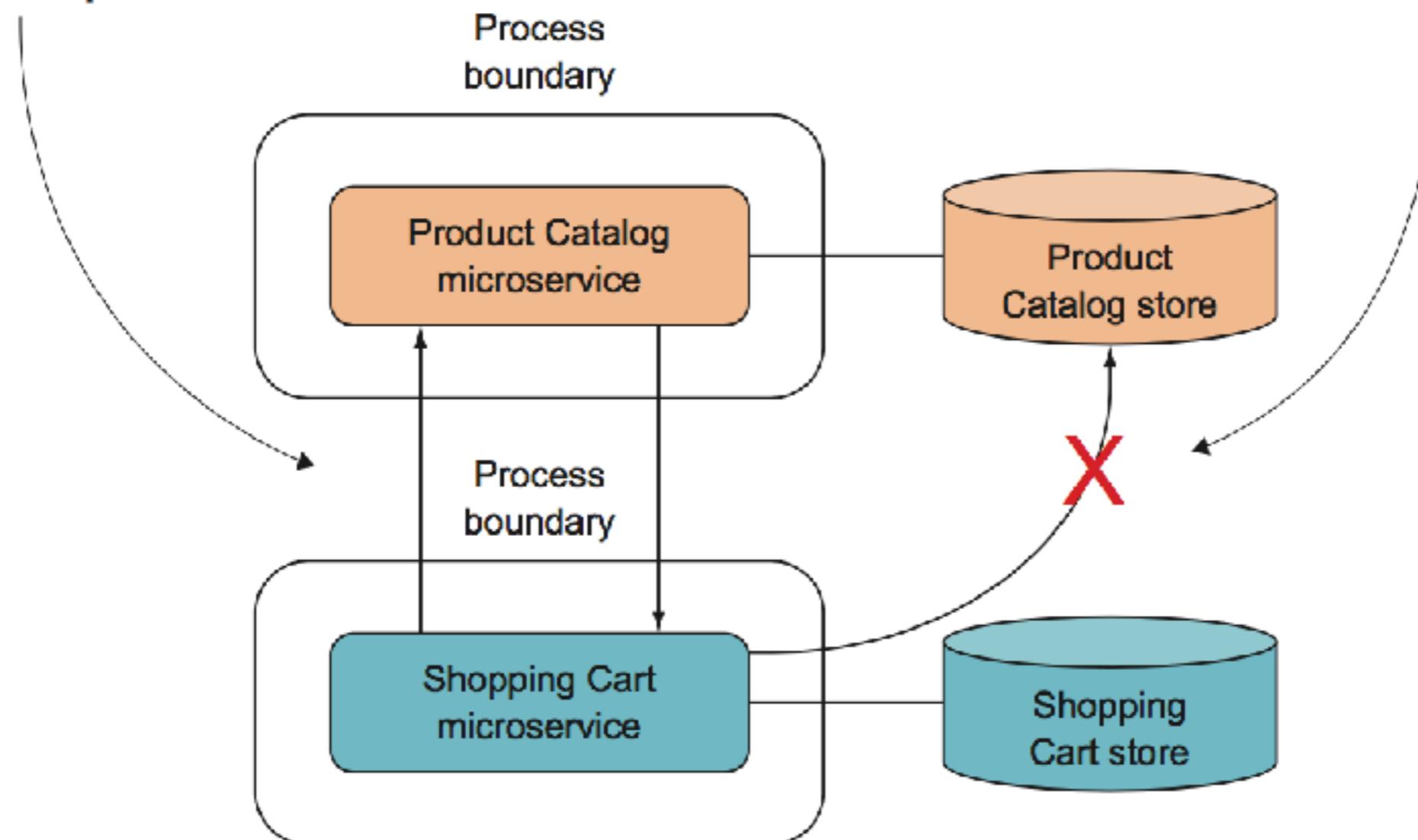


Figure 1.4 One microservice can't access another's data store.



5. Small team can maintain



6. Replaceable



Enabled system

Flexible
Scalable
Resilient



Challenges with Microservices ?



1. How to define the boundaries of each microservices ?



2. How to create queries that retrieve data from several microservices ?



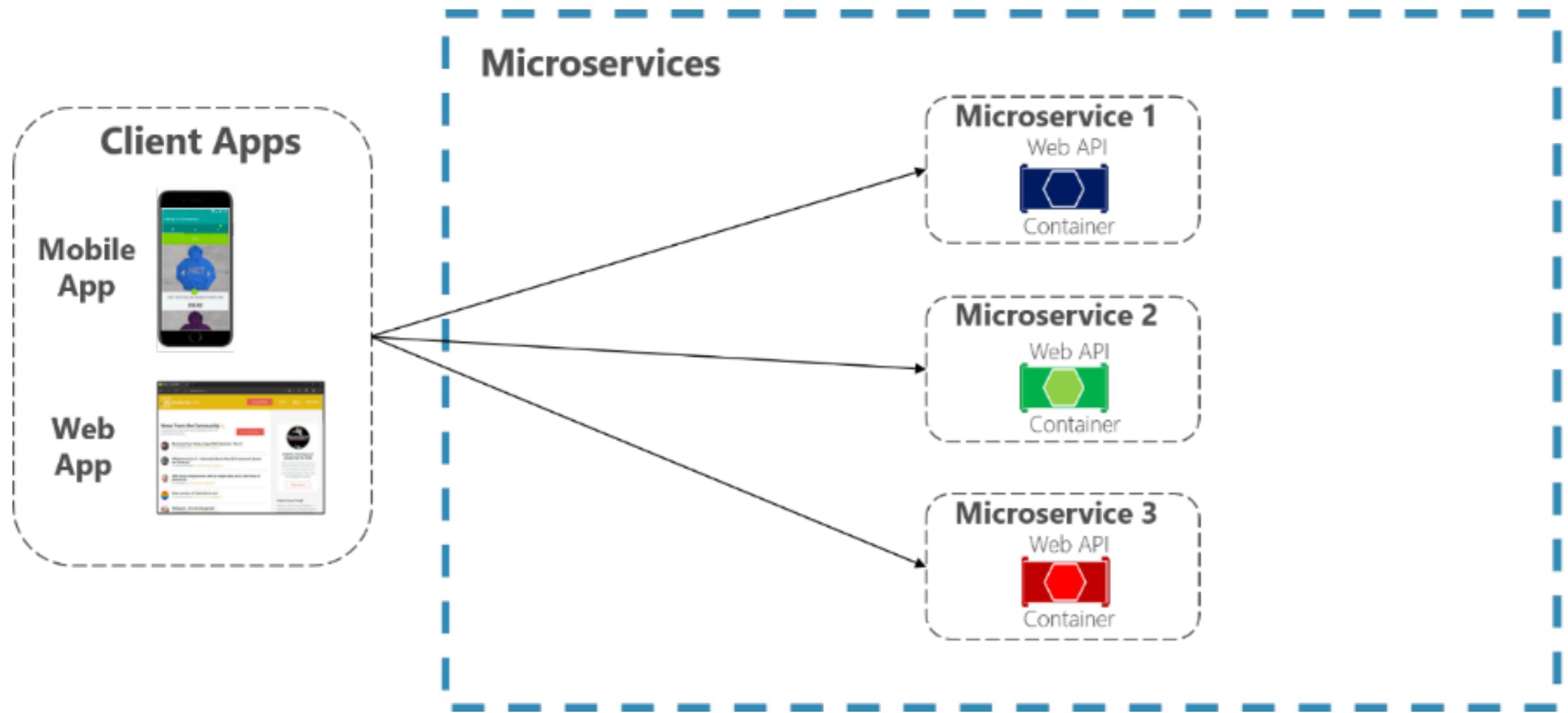
Popular solutions

API Gateway
CORS with query/read tables
Cold data in centralize database

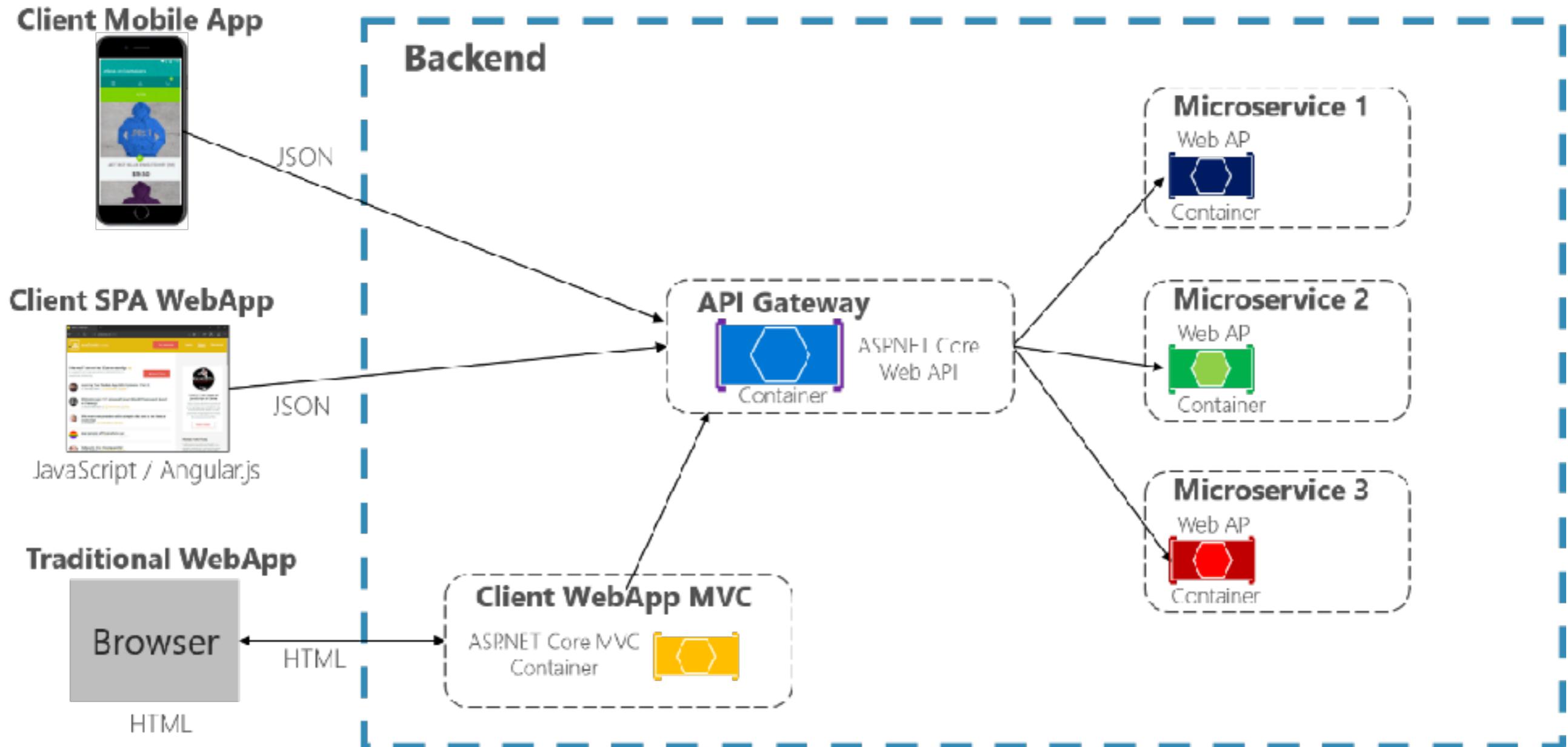


Direct Client-To-Microservice communication

Architecture

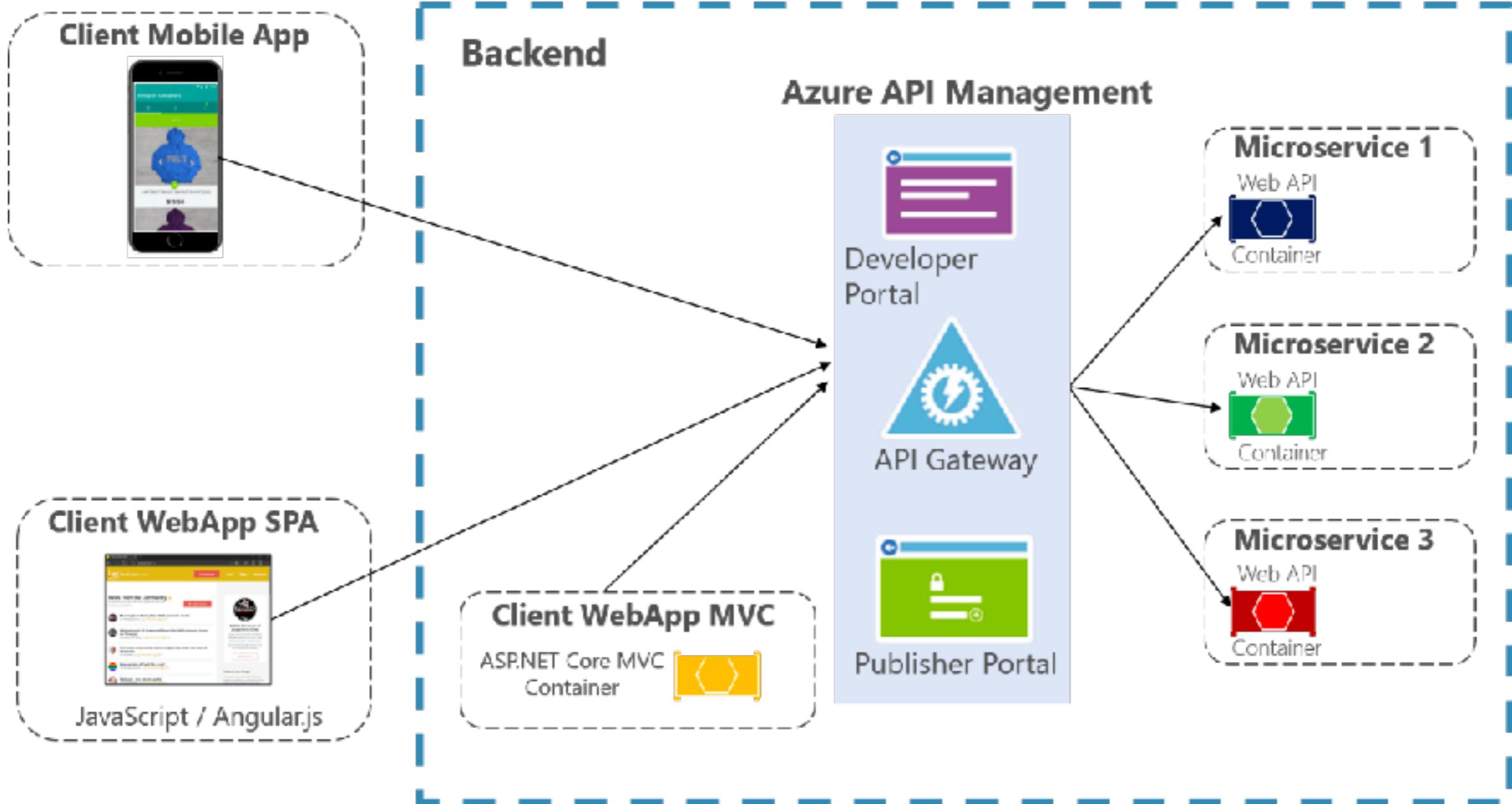


Using the API Gateway Service



API Gateway with Azure API Management

Architecture



3. How to achieve consistency across multiple microservices ?



Ordering microservice

Ordering API



ID	Quantity	ProductID

OrderItems Table
in Ordering-DB
(Remote SQL)

Catalog microservice

Catalog.API



ID	Stock	Name

Products Table
in Catalog-DB
(Remote SQL)

Don't

Databases are private per microservice

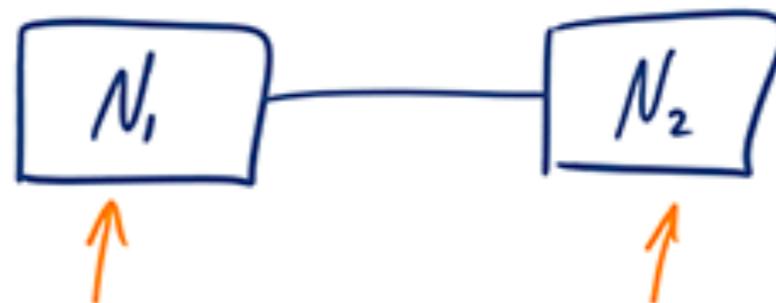


CAP Theorem

Consistency



Availability



Partition Tolerance



<http://robertgreiner.com/2014/08/cap-theorem-revisited/>



Microservices

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4. How to design communication across microservices boundaries ?



Protocols

HTTP and REST
AMQP
Messaging



Communication

Request-Response model
Observer model

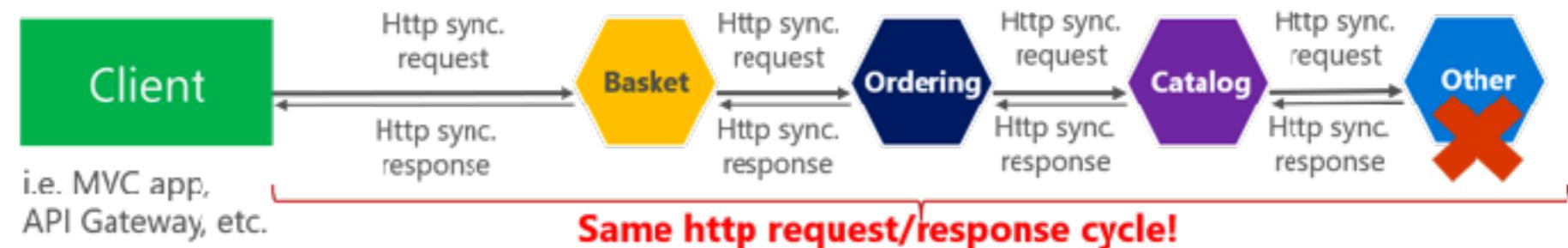


Communication

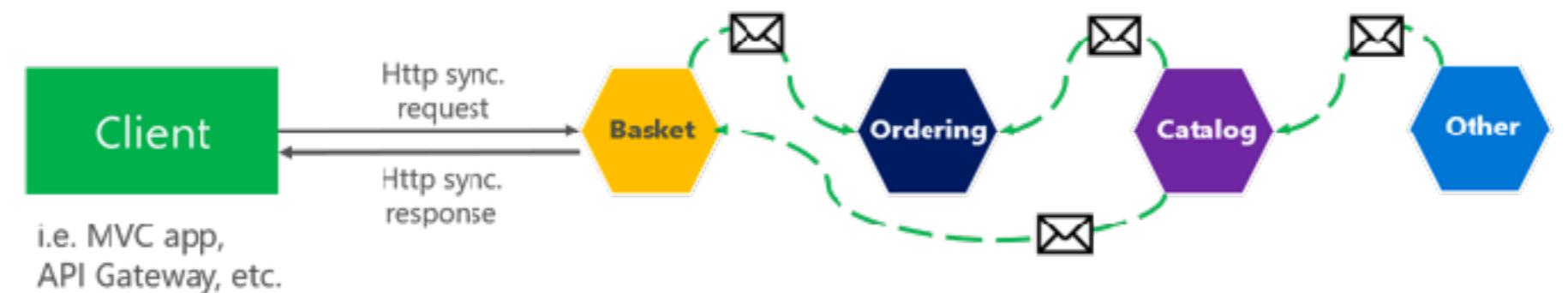
Synchronous vs. async communication across microservices

Anti-pattern

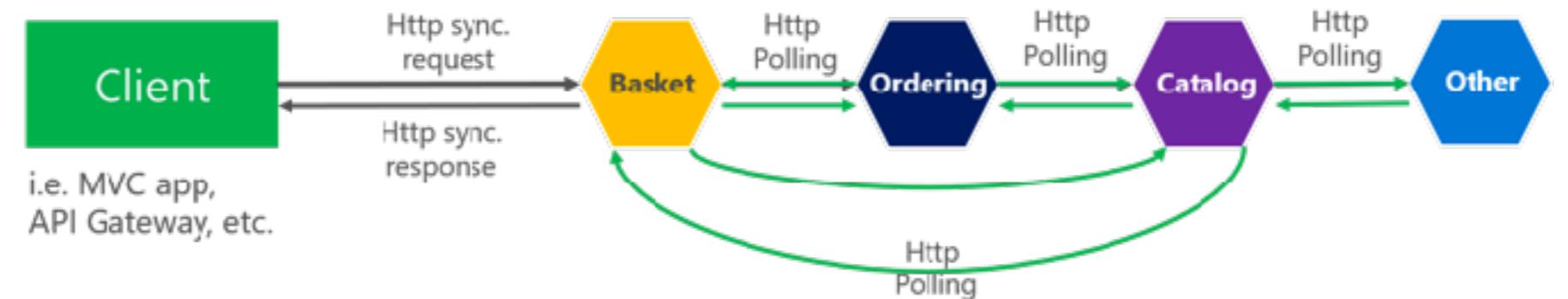
Synchronous
all req./resp. cycle



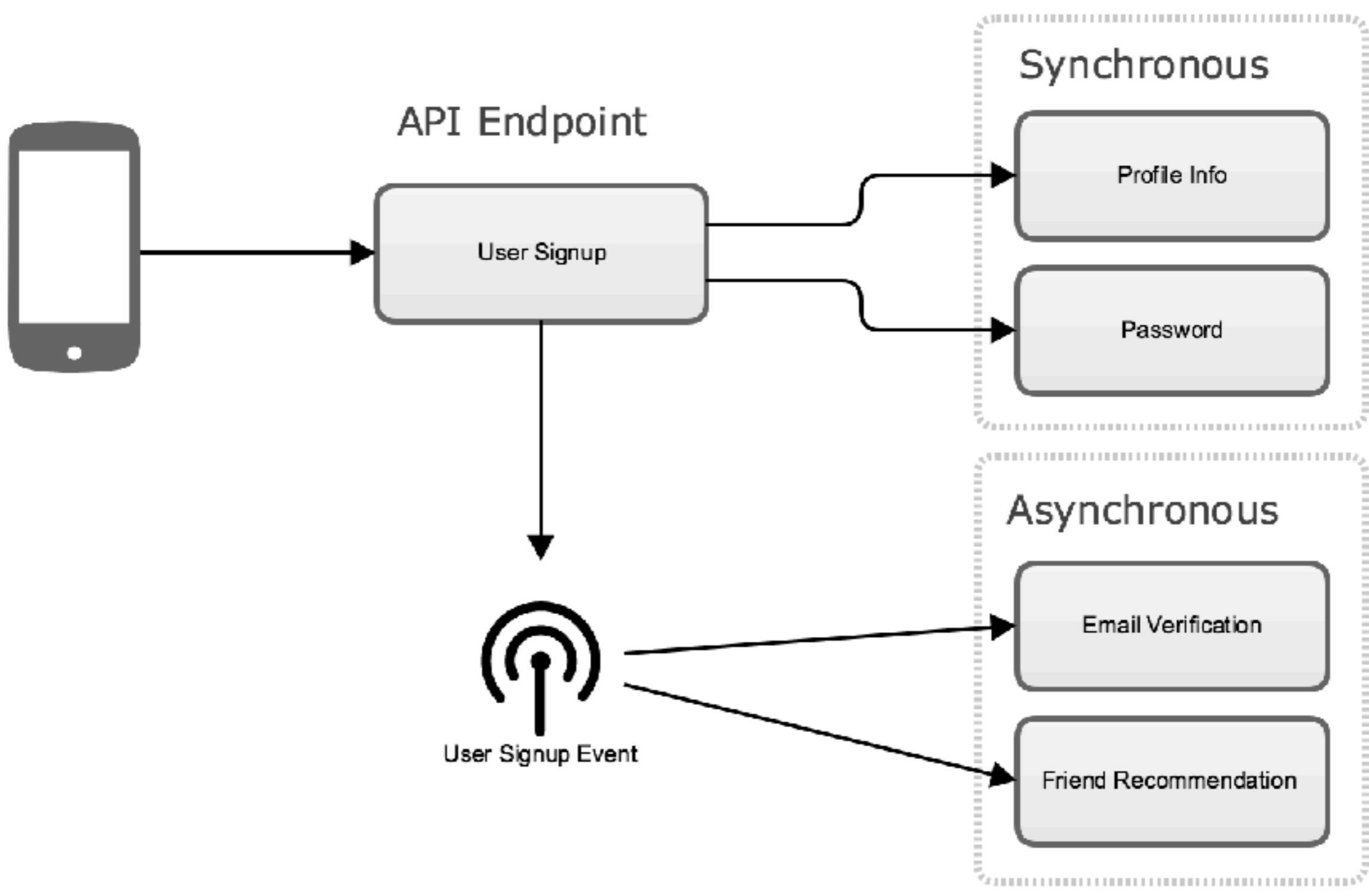
Asynchronous
Comm. across internal microservices
(EventBus: i.e. **AMQP**)



"Asynchronous"
Comm. across internal microservices
(Polling: **Http**)

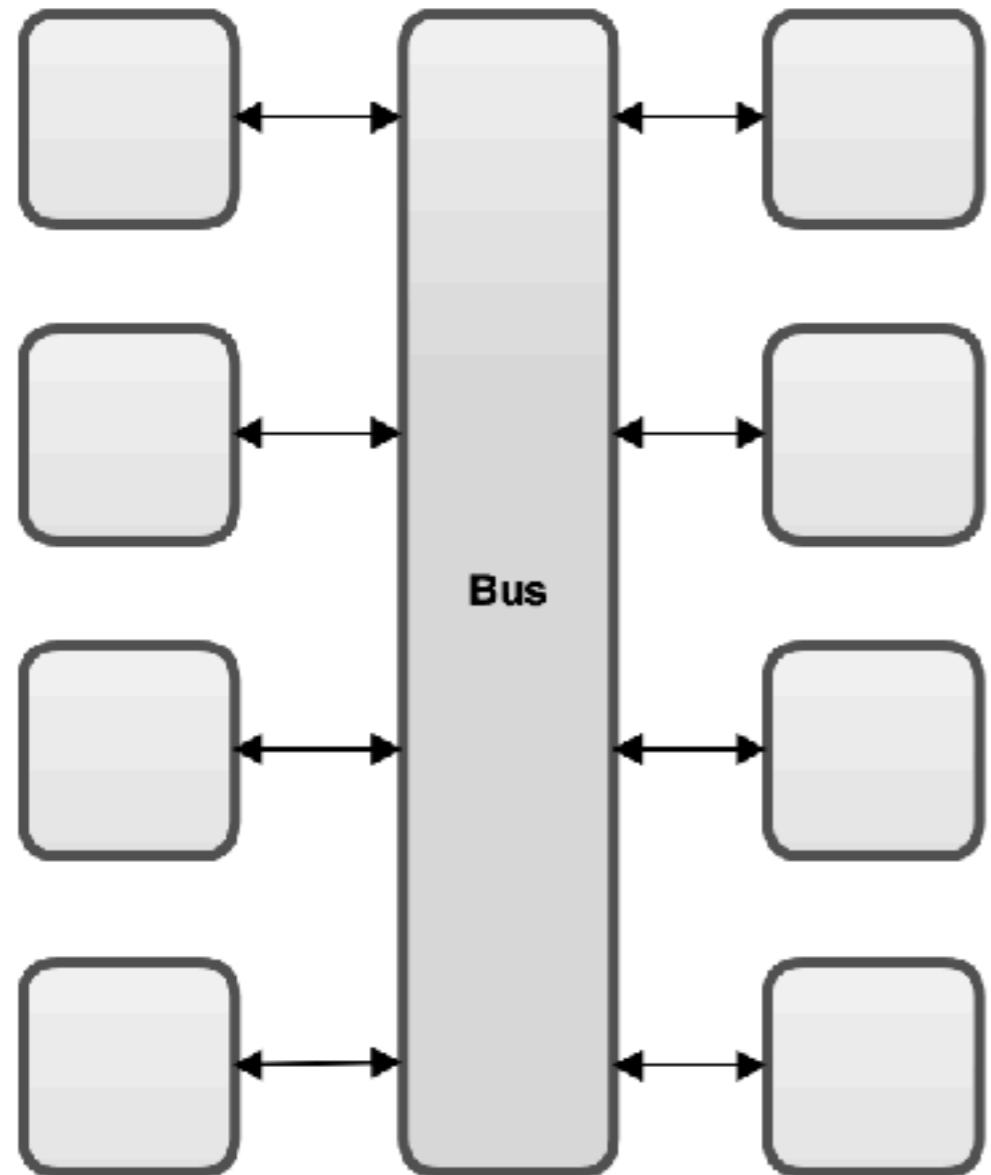


Communication

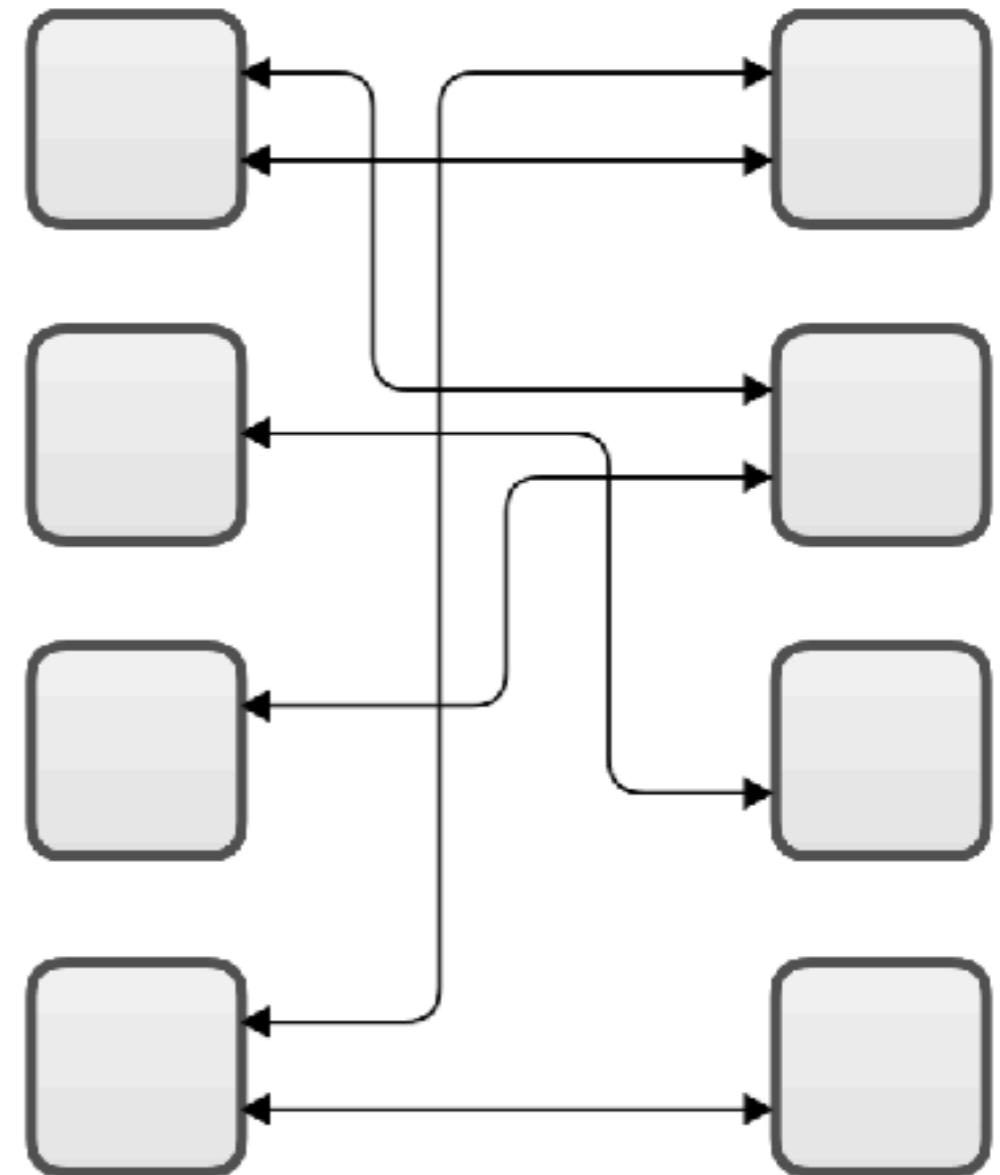


Anti-pattern :: centralize bus service

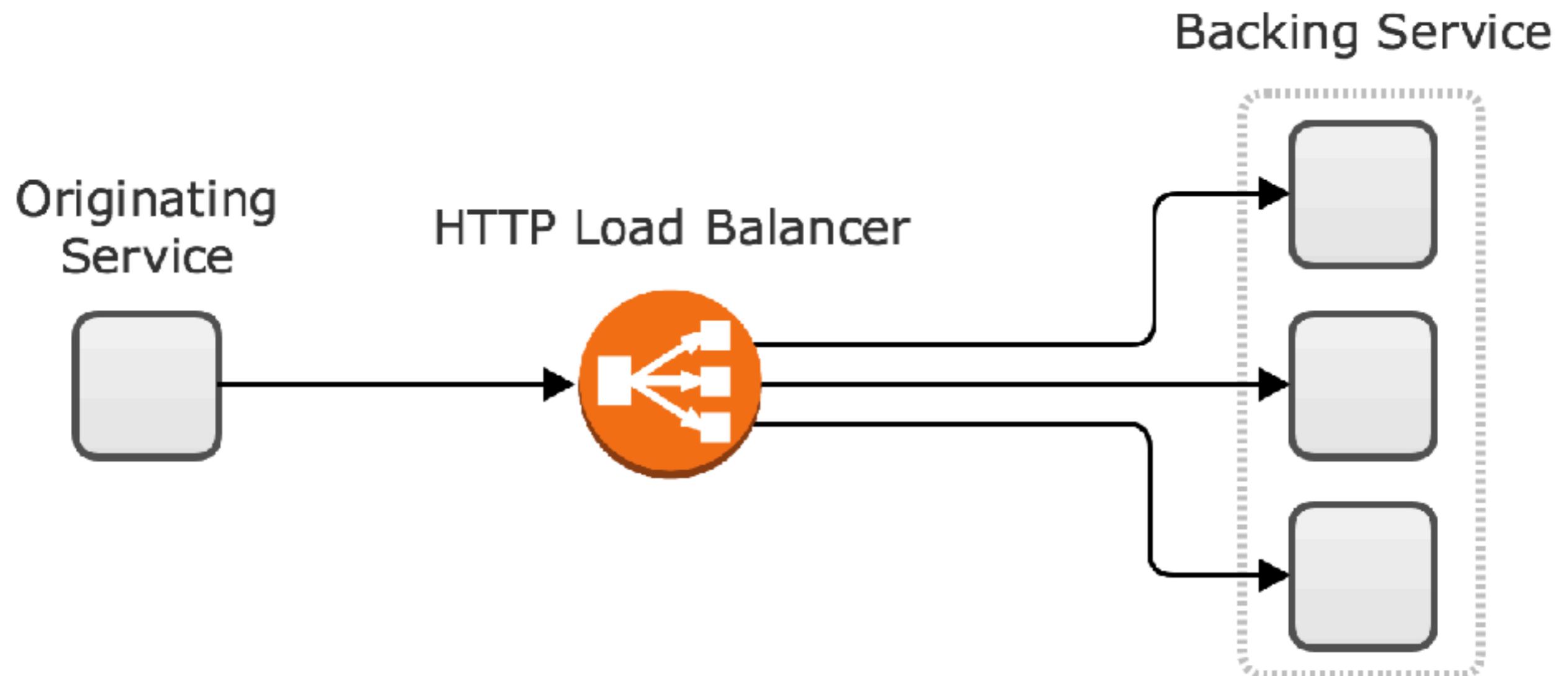
Central Bus



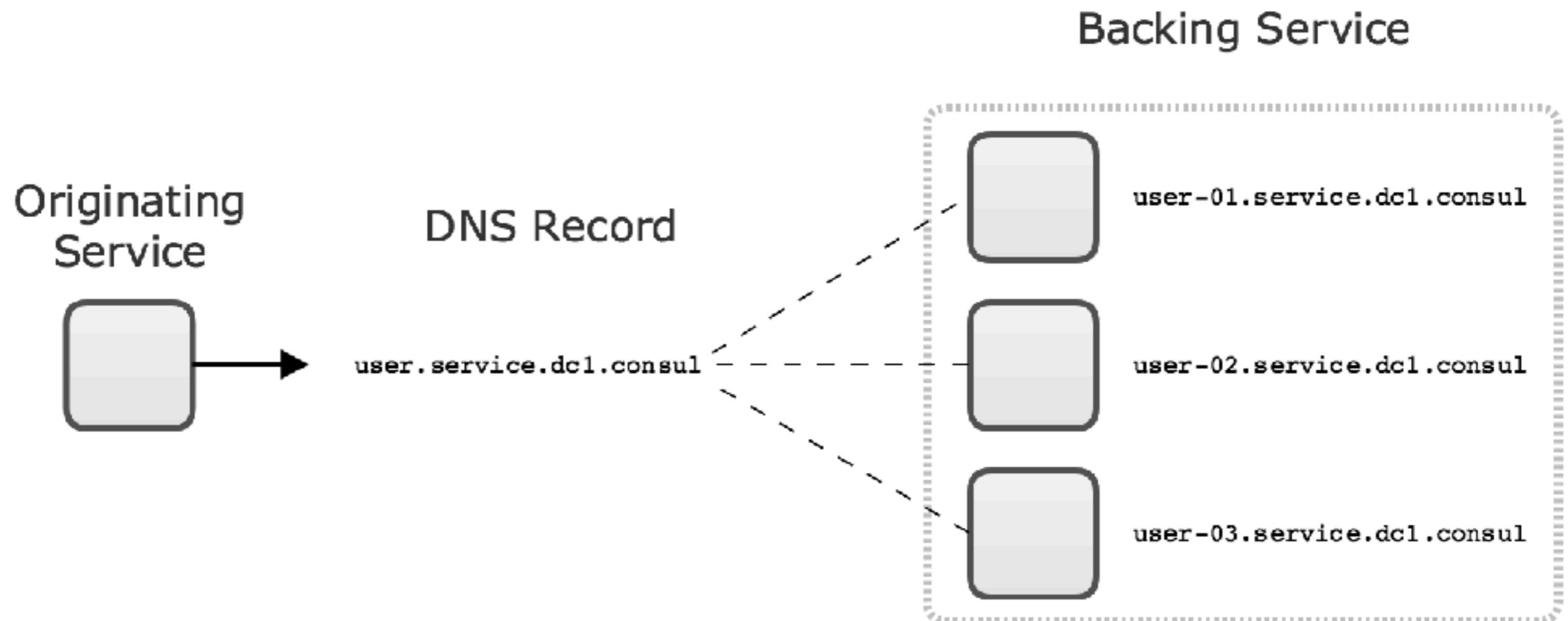
Decentralized



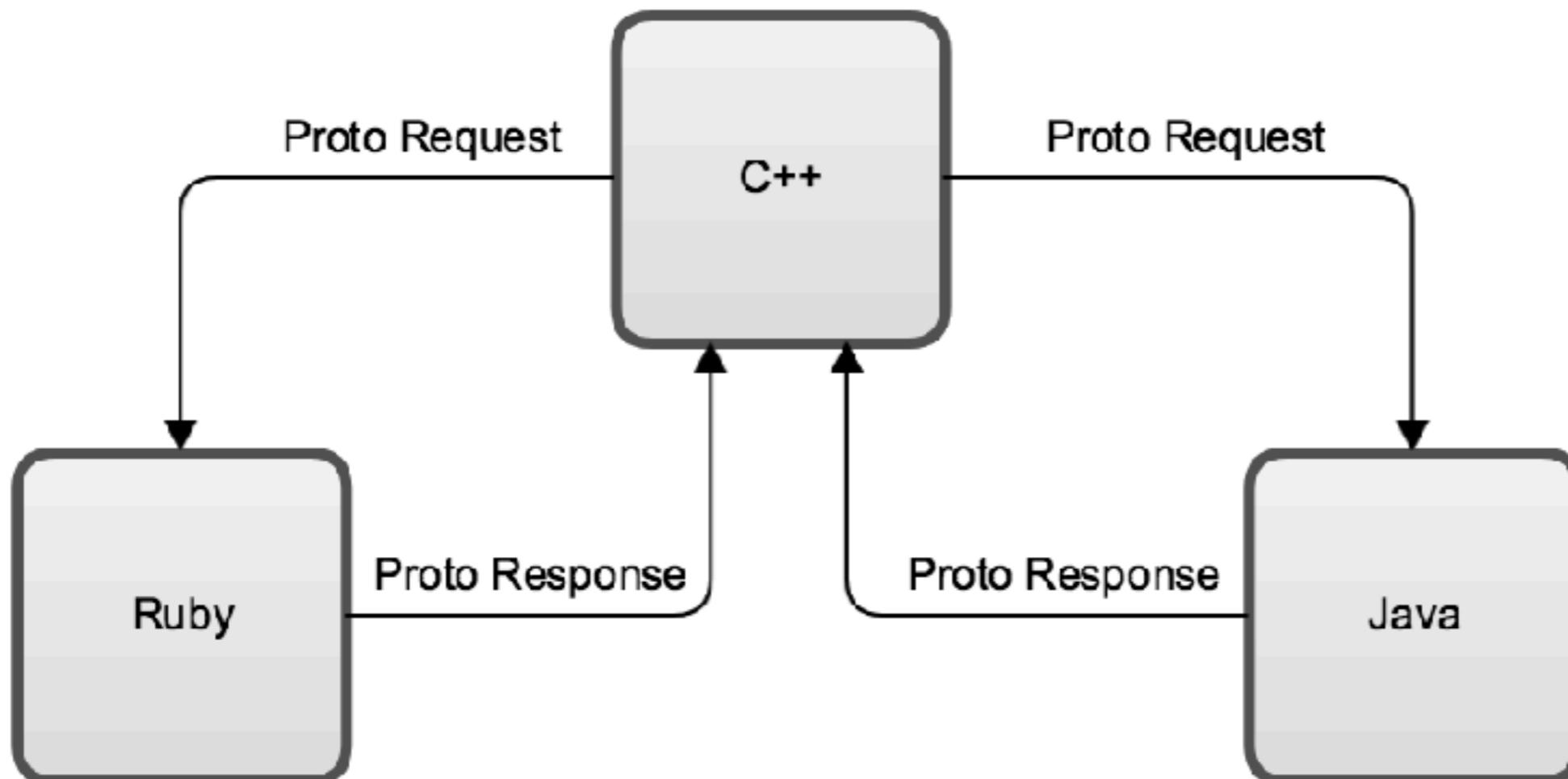
Request-response model



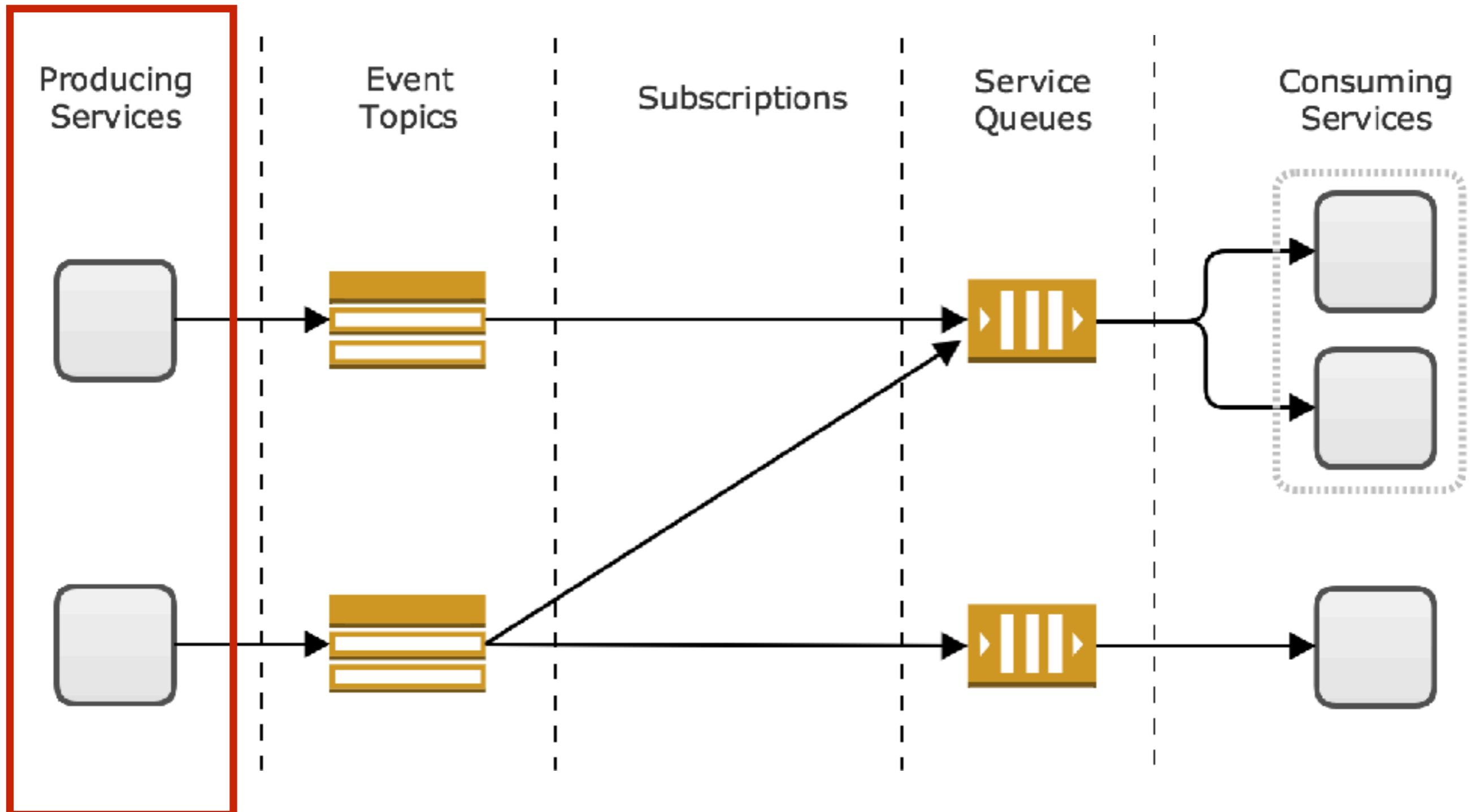
Request-response model



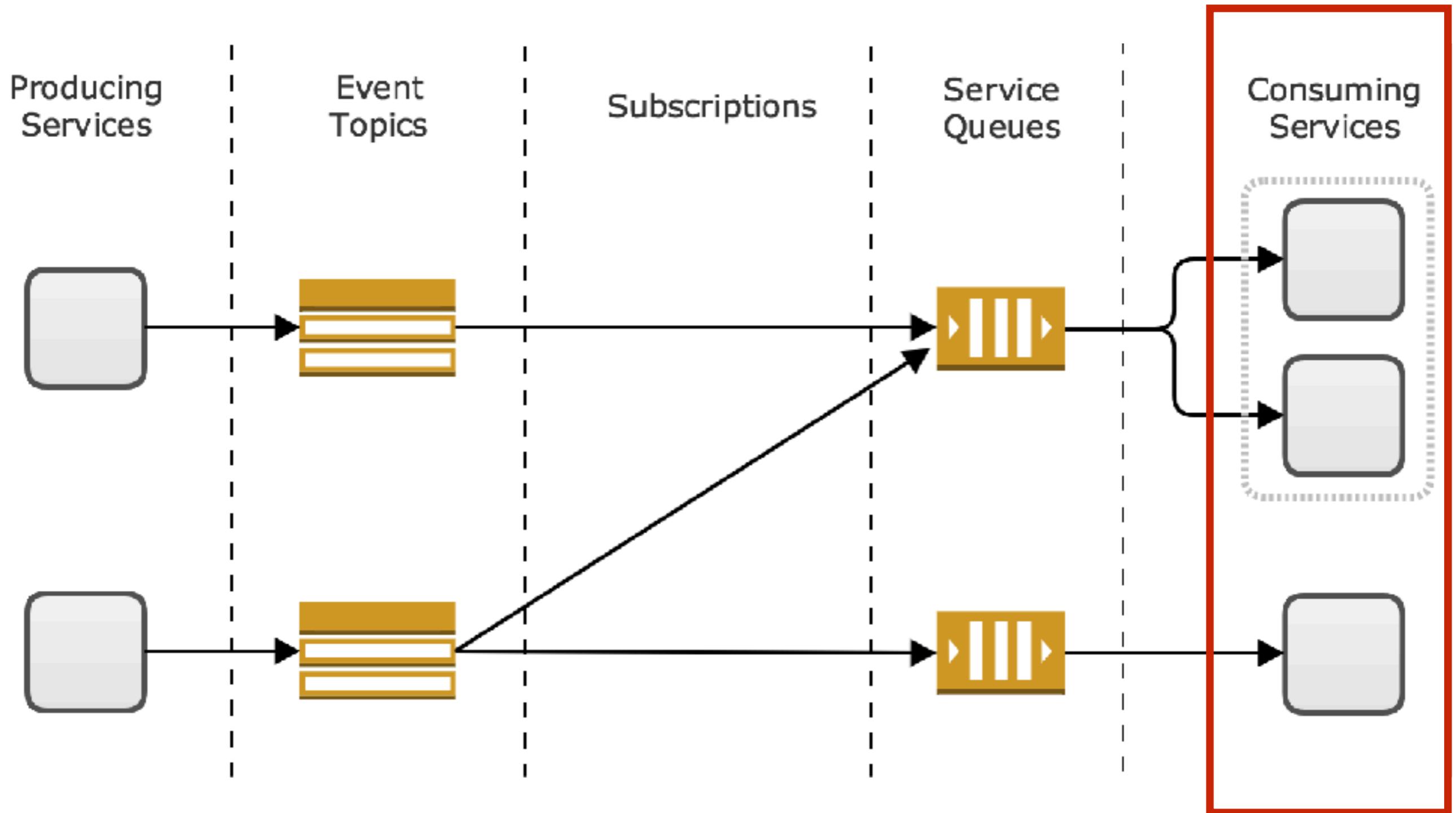
Request-response model



Observer model



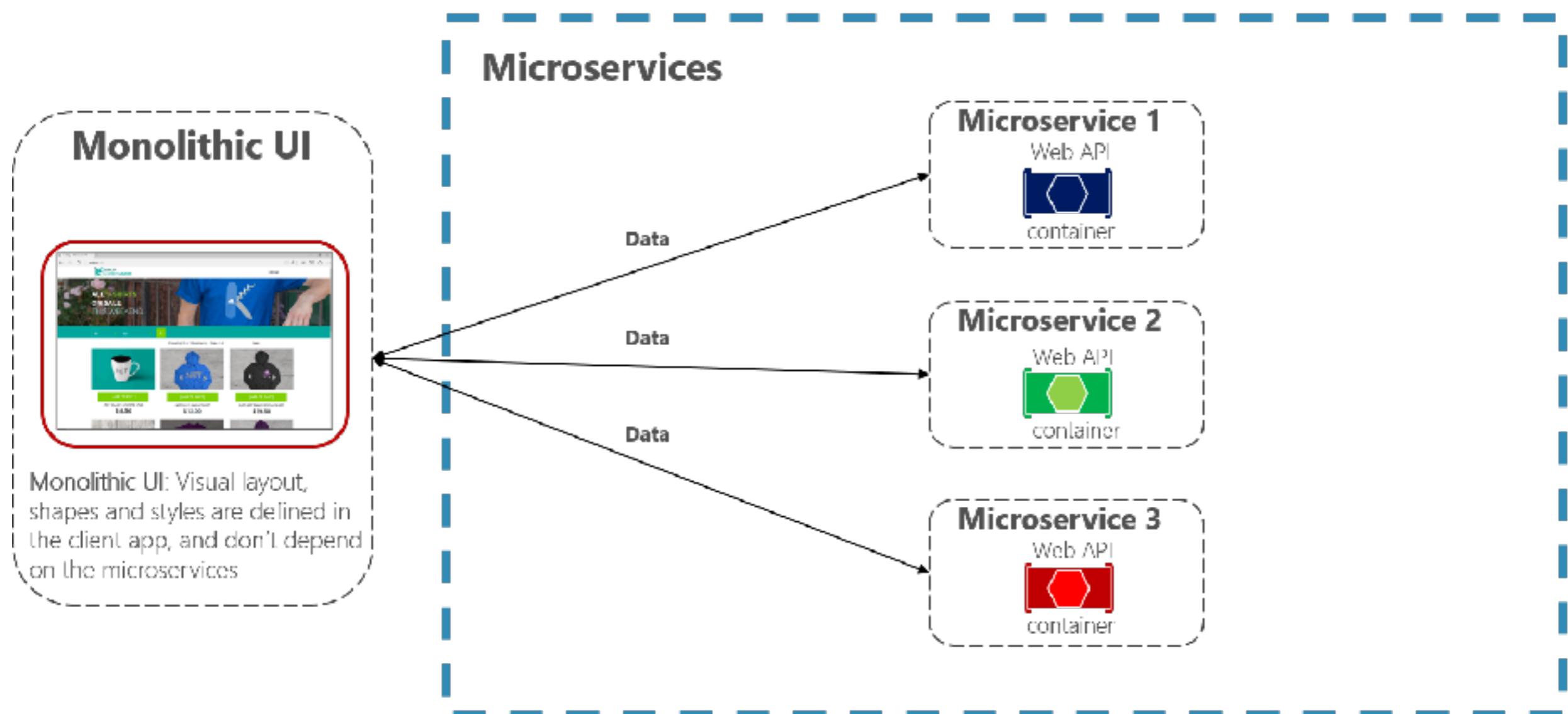
Observer model



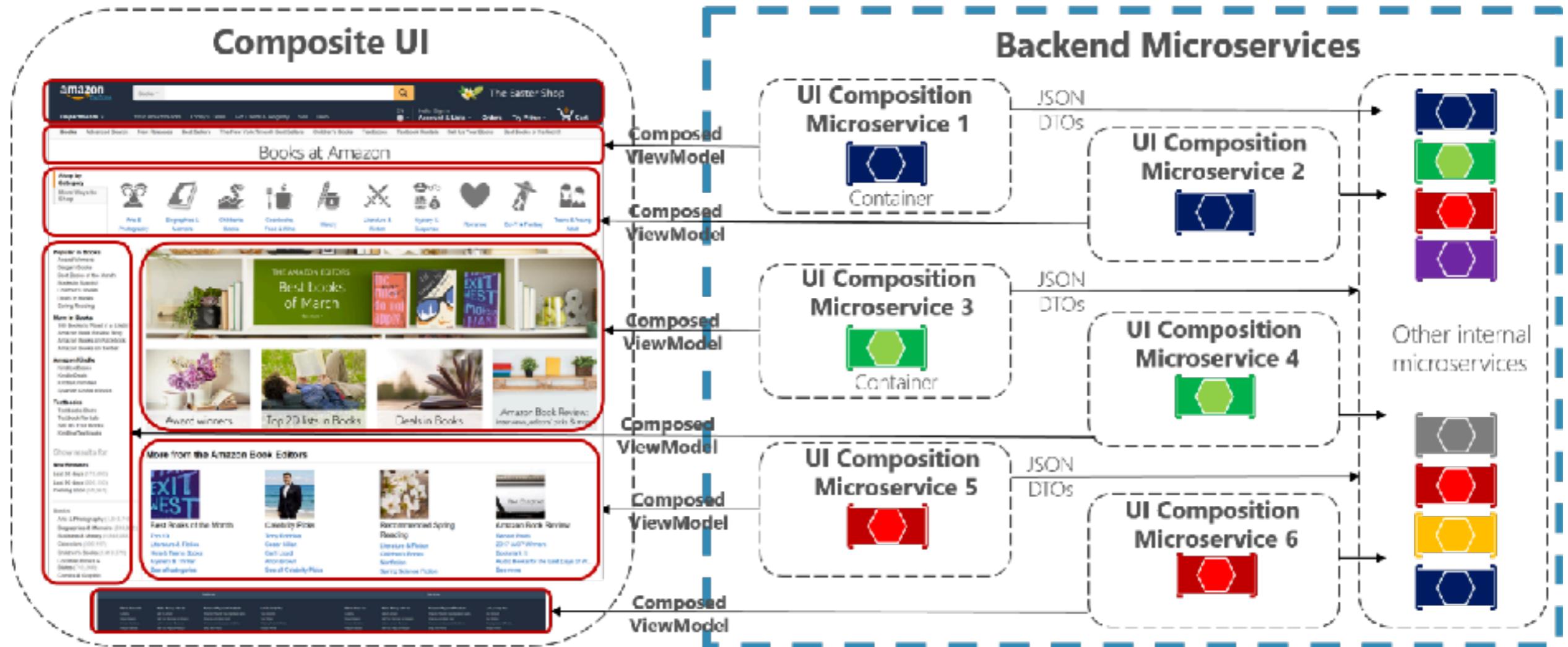
Integrate with User Interface

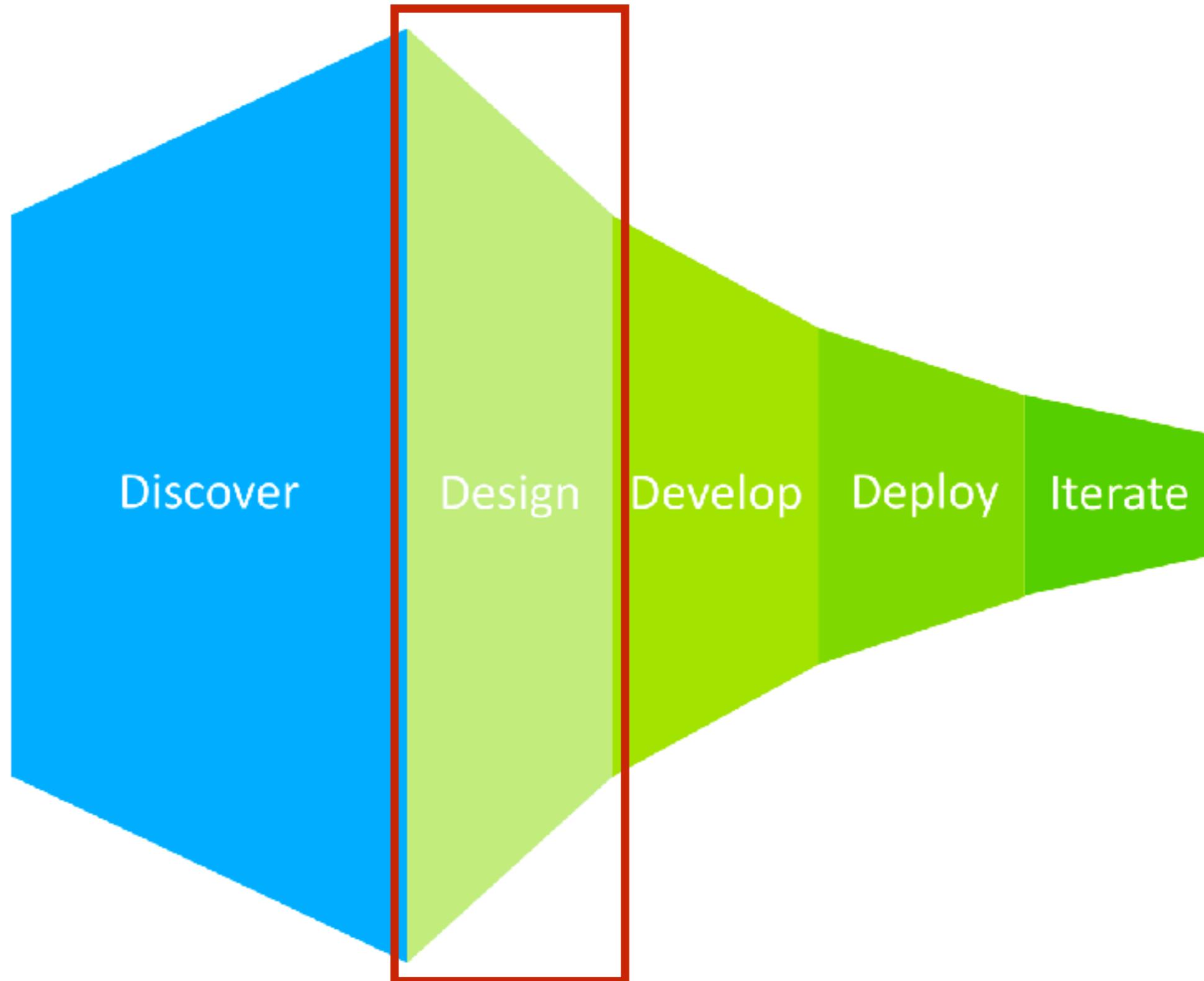


Monolithic UI consuming microservices



Composite UI generated by microservices





Let's workshop with Design



E-commerce system



1. Search product by name

Adidas NMD

350 ค้นพบสินค้าสำหรับ "Adidas NMD"

เรียงตาม: ความเป็นที่นิยม

จำนวนคณิต:

Adidas Yeezy Boost 350 V2 Beluga 2.0 (AH2203)	฿28,900.00	฿30,000.00 -28%
Adidas NMD R1 Primeknit Core Black / Core Black...	฿9,900.00	฿15,000.00 -34%
Adidas NMD R1 PK Japan Triple Black (BZ0220)	฿12,900.00	฿15,000.00 -14%
POCA SHOE NMD Sneakers Fashion รองเท้า ลำลอง ผ้าใบ ...	฿399.00	฿1,000.00 -79%
Adidas NMD R1 Color Core Black/Icey Blue (BY9951)	฿7,990.00	฿12,000.00 -33%



2. Choose a product

Adidas NMD

🔍 ⚒ ร้านค้า ทางการ ⚒ Taobao คอลเลกชัน ⚒ ไฟฟ์สเกต & เติมเงิน ⚒ สโตร์ด ลดเพิ่ม

350 ค้นพบสินค้าสำหรับ "Adidas NMD"

เรียงตาม: ความเป็นที่นิยม

จำนวนคณิต:

Adidas Yeezy Boost 350 V2 Beluga 2.0 (AH2203) ฿28,900.00 ฿30,000.00 -28%	Adidas NMD R1 Pimeknit Core Black / Core Black... ฿9,900.00 ฿15,000.00 -34%	Adidas NMD R1 PK Japan Triple Black (BZ0220) ฿12,900.00 ฿15,000.00 -14%	POCA SHOE NMD Sneakers Fashion รองเท้า ลำลอง ผ้าใบ ... ฿399.00 ฿1,000.00 -79% 🔥 ★★★★★ (70) ลูกค้าป้าราก	Adidas NMD R1 Color Core Black/Icey Blue (BY9951) ฿7,990.00 ฿12,000.00 -33% ★★★★★ (1) ลูกค้าป้าราก



3. Show product detail

POCA SHOE NMD Sneakers Fashion รองเท้า ลำลอง ผ้าใบ ผู้หญิง-ผู้ชาย แฟชั่น
ราคาถูกswyฯ Sport Unisex รุ่น PSN-Black/White

★★★ (70) แสดงความคิดเห็น
ชื่อ Poca Shoes | เพิ่มเติม สุภาพบุรุษ จาก Poca Shoes



2 Weeks Warranty by Seller [เพิ่มเติม](#)

- สวมใส่สบาย
- เพิ่มเติม

เลือก ขนาด

ขนาด [เลือก](#)

399 บาท

ราคาปกติ 1,900 บาท,
ประหยัดทันที 79%
ราคาโปรโมชั่นสามารถใช้ได้กับ 25/2/2018

เลือกกร้า

← วิธีการสั่งซื้อ



4. Add product to basket

POCA SHOE NMD Sneakers Fashion รองเท้า ลำลอง ผ้าใบ ผู้หญิง-ผู้ชาย แฟชั่น
ราคาถูกswyxy Sport Unisex รุ่น PSN-Black/White

★★★★ (70) แสดงความคิดเห็น

ชื่อ Poca Shoes | เพิ่มเติม สุภาพบุรุษ จาก Poca Shoes



2 Weeks Warranty by Seller [เพิ่มเติม](#)

- สวมใส่สบาย [เพิ่มเติม](#)

เลือก ขนาด

ขนาด [เลือก](#)

399 บาท

ราคาปกติ 1,900 บาท,
ประหยัดทันที 79%
ราคาโปรโมชั่นสามารถใช้ได้กับ 25/2/2018

ใส่ตะกร้า



5. Show data in basket

✓ สินค้า 1 ชิ้น ได้ถูกเพิ่มเข้าไปยังตะกร้าสินค้าของคุณ



POCA SHOE NMD Sneakers
Fashion รองเท้า ล่าสุด ผ้าใบ ผู้หญิง-ผู้ชาย แฟชั่น ราคาถูกswy Sport
Unisex รุ่น PSN-Black/White

ไซส์: EU:40

Poca Shoes

399 บาท

1,900 บาท 79% ลด

ตะกร้าสินค้าของคุณ (1 สินค้า)

มูลค่าสินค้า: **399 บาท**

ยอดสุทธิ รวมภาษีมูลค่าเพิ่ม (จำนวน): **399 บาท**

[เลือกชื่อสินค้าต่อ](#)

[ชำระค่าสินค้า](#)

People Who Bought This Item Also Bought



กางเกงสแลคขายาว Hopper Progress พั้ยิด ทรงเข้ารูป

900 บาท

67% ลด

299 บาท



6. Checkout

✓ สินค้า 1 ชิ้น ได้ถูกเพิ่มเข้าไปยังตะกร้าสินค้าของคุณ



POCA SHOE NMD Sneakers
Fashion รองเท้า ล่าสุด ผ้าใบ ผู้หญิง-ผู้ชาย แฟชั่น ราคาถูกswy Sport
Unisex รุ่น PSN-Black/White

ไซส์: EU:40

Poca Shoes

399 บาท

1,900 บาท 79% ลด

ตะกร้าสินค้าของคุณ (1 สินค้า)

มูลค่าสินค้า: **399 บาท**

ยอดสุทธิ รวมภาษีมูลค่าเพิ่ม (จำนวน): **399 บาท**

เลือกชื่อสินค้าต่อ

ชำระค่าสินค้า

People Who Bought This Item Also Bought



กางเกงสแลคขาขวาง Hopper Progress ผ้ายืด ทรงเข้ารูป

900 บาท

67% ลด

299 บาท



7. Shipping

LAZADA
CO-TH

1. คำสั่งซื้อ

2. ชำระเงิน

ที่อยู่ที่จะจัดส่ง

Login for speedy checkout

ชื่อและนามสกุล	ที่อยู่	รหัสไปรษณีย์	เมือง	จังหวัด	โทรศัพท์มือถือ
อีเมล กุลมาศ อีเมล์ของห่าน	ที่อยู่	กรุงเทพมหานคร/ Bangkok	กรุงเทพฯ	กรุงเทพมหานคร/ Bangkok	+66 ๐๘๑ ๒๓๔๕๖๗๘

ทางเราจะทำการตรวจสอบเนื้องและจังหวัดของคุณ

ท่องเที่ยวในประเทศ/ในกำกับภาษี - กรุณาเดือนของการขอข้อมูลเพื่อทำการขอในกำกับภาษี

ข้อมูลการส่งเงินค่า

ช่องแบบชำระเงิน: พรี

Get it วันอังคาร, 27 ก.พ. - วันจันทร์, 5 มี.ค. 2018

ค่าจัดส่ง

สูปการสั่งซื้อ (1 items)

สินค้า	จำนวน	ราคารวม
POCA SHOE NMD Sneakers Fashion รองเท้า ลั่นสอง ผ้าใบ ผู้หญิง-ผู้ชาย แฟชั่น ราคาถูกสุดๆ Sport Unisex รุ่น PSN-Black/White ขนาด: EU:40	1	399 บาท
รวมค่าสินค้า		399 บาท
ยอดสุทธิ รวมรวมภาระค่าสัมภาระ (ถ้ามี)		399 บาท

 คุ้มครองสูงสุด 100%





8. Payment

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.CO.TH

✓ 1. ค่าซื้อขั้นต่ำ

2. ชำระเงิน

เลือกคัวเลือกสำหรับการชำระเงิน

บัตรเดบิตหรือ เทิร์บเงินปลายทาง	ชำระเงินผ่าน เดบิตหรือ	PayPal/Amex	มอนชาร์	LINE Pay	หักบัญชีธนาคาร/ ห้องทางATM

หมายเหตุบัตร

ชื่อบนบัตร

วันที่บัตรหมดอายุ

 CCV / CVV

ข้อมูลใบสำคัญไม่สามารถเปลี่ยนแปลงได้หลังการสั่งซื้อสินค้า

🔒 สั่งซื้อสินค้า

สมัครรับข่าวสารกับลาชาค้าเพื่อรับส่วนลดและข้อเสนอสุดพิเศษ

ในการซื้อสินค้าทางช่องทางที่กำหนดให้ และ ร้ออกกลและเพื่อนไป

VERIFIED by VISA MasterCard SecureCode.

ส่งที่ **ไทย**

Somkiat Puisungnoen
122/64 , Sci Phahonyothin 2, Phahonyothin Road Prom Condo กรุงเทพมหานคร/ Bangkok - พญาไท/ Phaya Thai - 10400 โทรศัพท์: 0868696209

สรุปการสั่งซื้อ (1 items)

สินค้า	จำนวน	ราคา
POCA SHOE NMD Sneakers Fashion รองเท้า ลั่วสัง ค้าใน ถู๊หุ๊หุ๊-หุ๊หุ๊ แฟชั่น ราคากลางๆ Scott Unisex รุ่น PSN-Black/White ขนาด: EU:40	1 <small>เม็ดกด</small>	399

ส่งแบบธรรมด้า
วันอังคาร, 27 ก.พ. - วันเสาร์, 3 มี.ค. 2018

กรอกคุณปวงส่วนลดที่นี่ **ขึ้นชัน**

มูลค่าสินค้า **399 บาท**
ค่าซื้อขั้นต่ำ **บาท**

ยอดสุทธิ **399 บาท**
รวมภาษีมูลค่าเพิ่ม (มีภาษี)

ทุมควรดูแล 100%

JUN-2016 **more security - less risk**



9. Confirm to order

LAZADA
.CO.TH

✓ 1. ค่าซื้อขั้นต่ำ

2. ชำระเงิน

เลือกคัวเลือกสำหรับการชำระเงิน

บัตรเดบิตหรือ เทิร์บเงินปลายทาง	ชำระเงินผ่าน เดบิตหรือ	PayPal/Amex	มอนชาร์บ	LINE Pay	หักบัญชีธนาคาร/ ห้องทางATM

หมายเหตุบัตร

ชื่อบนบัตร Somkiat Puisungnoen

วันที่บัตรหมดอายุ mm yy CCV / CVV ?

ข้อมูลใบกำกับภาษีไม่สามารถเปลี่ยนแปลงได้หลังการสั่งซื้อสินค้า

ล็อก สั่งซื้อสินค้า

สมควรระบุรายละเอียดตามส่วนลดและเงื่อนไขของสูตรพิเศษ

ส่งที่ แก้ไข

Somkiat Puisungnoen
122/64 , Sci Phahonyothin 2, Phahonyothin Road Prom Condo กรุงเทพมหานคร/ Bangkok - พญาไท/ Phaya Thai - 10400 โทรศัพท์: 0868696209

สรุปการสั่งซื้อ (1 items)

สินค้า	จำนวน	ราคา
POCA SHOE NMD Sneakers Fashion รองเท้า ลำลอง ถ้าใบ สีฟ้า-ฟ้าเข้ม ราคากลางๆ Scott Unisex รุ่น PSN-Black/White ขนาด: EU:40	1	399 <small>ยกออก</small>
ส่งแบบธรรมด้า		
วันอัจฉริยา, 27 ก.พ. - วันเสาร์, 3 มี.ค. 2018		

กรอกคุณปวงส่วนลดที่นี่ **ขึ้นชั้น**

มูลค่าสินค้า **399 บาท**
ค่าซื้อขั้นต่ำ บาท

ยอดสุทธิ **399 บาท**
รวมภาษีมูลค่าเพิ่ม (มีภาษี)

ทุมดาวลูกค้า 100%

Lazada Security Approved JUN-2016



Microservices

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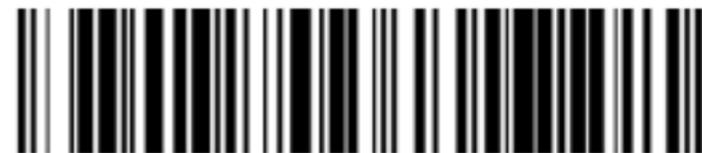
10. Summary



ใบแจ้งการชำระเงิน(PaySlip)

Counter Service Co., Ltd.

เลขที่ใบแจ้ง สินค้า/Invoice No:	3779254692
ผู้ชำระ เงิน/Payer:	Somkiat Puisungnoen
วันที่รายการ / Transaction Date:	25/02/2018 23:33
กำหนดชำระเงิน / Expired Date:	27/02/2018 23:33
เพื่อเข้าบัญชี / Payee:	www.lazada.co.th Tel: 020180000
รายละเอียด / Detail:	Lazada



806010855864737

จำนวนเงินที่ชำระ / Amount:

399.00 บาท /THB

* ไม่รวมค่าธรรมเนียมของเดนเน็คอร์เซอร์วิส
(Excluding service fees at Counter Service)

คลิกปุ่ม "Print" พิมพ์ใบแจ้งการชำระเงิน
หรือ

กด "รหัส 15 หลักใต้بارك็อก" เพื่อเข้าไป
ชำระเงินที่
Press "Print" button or write down
paycode 15 digits for pay in cash at
counter service(7-11)



[Back to merchant](#)

[Print](#)

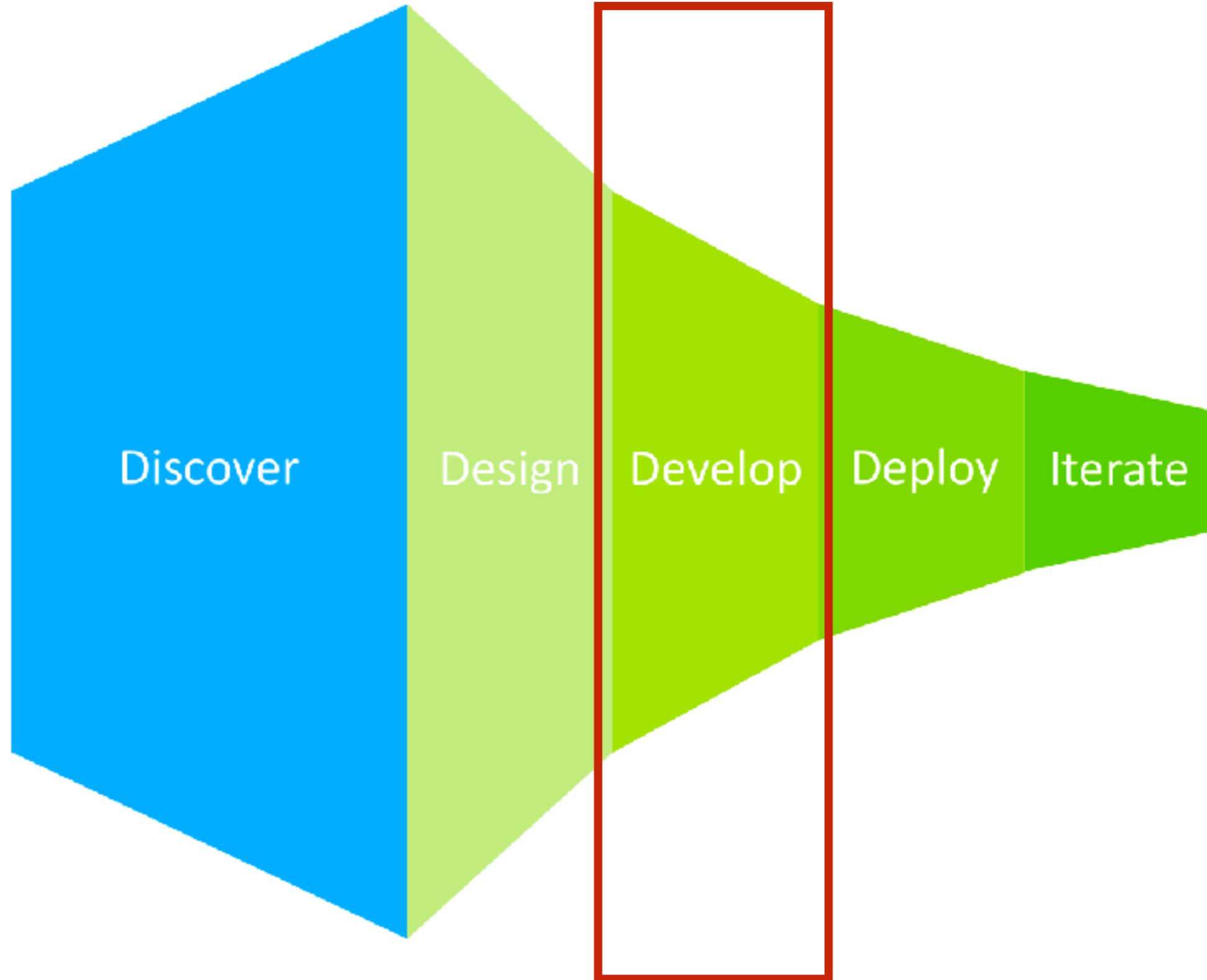


Microservices

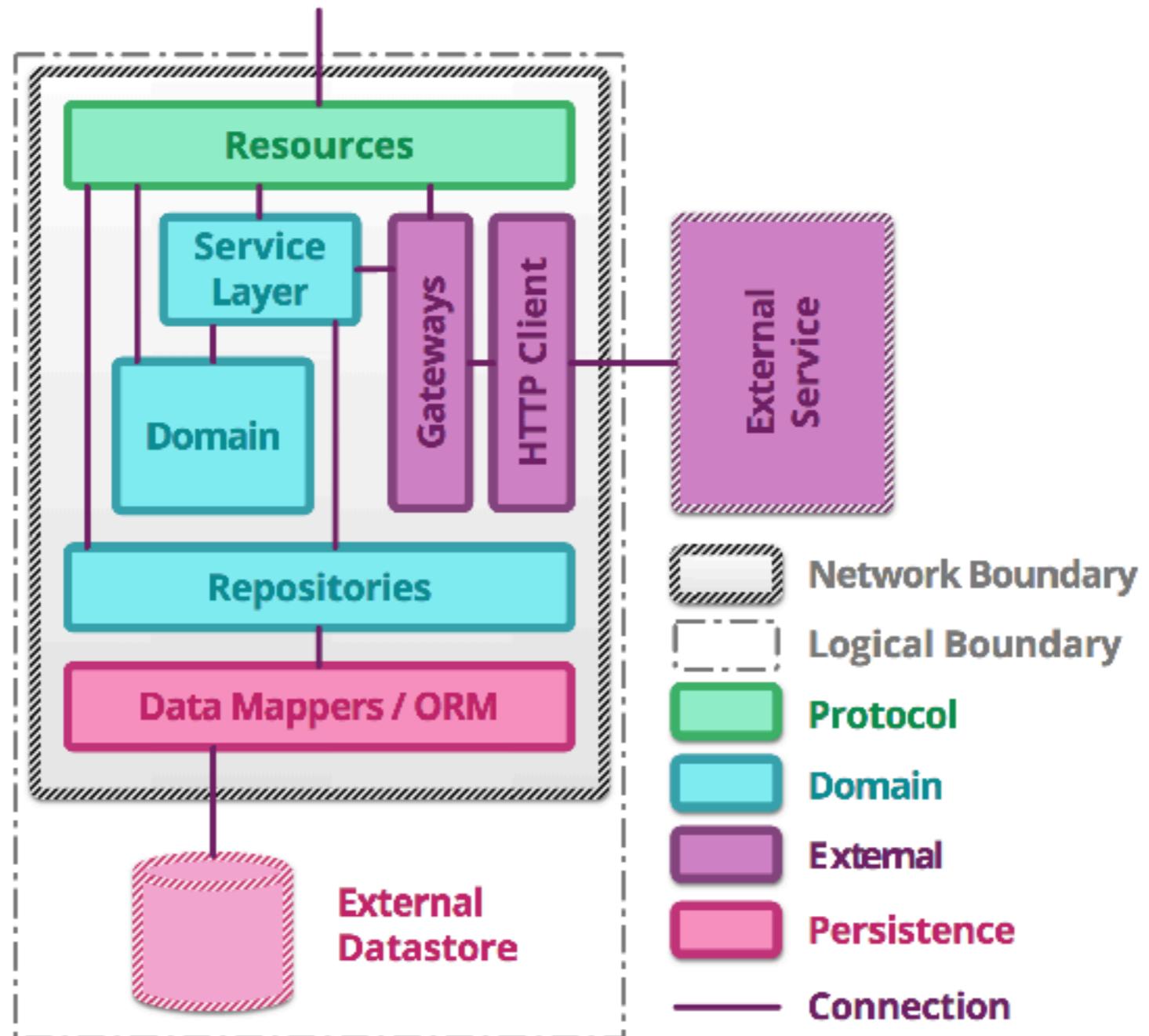
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Try to design system





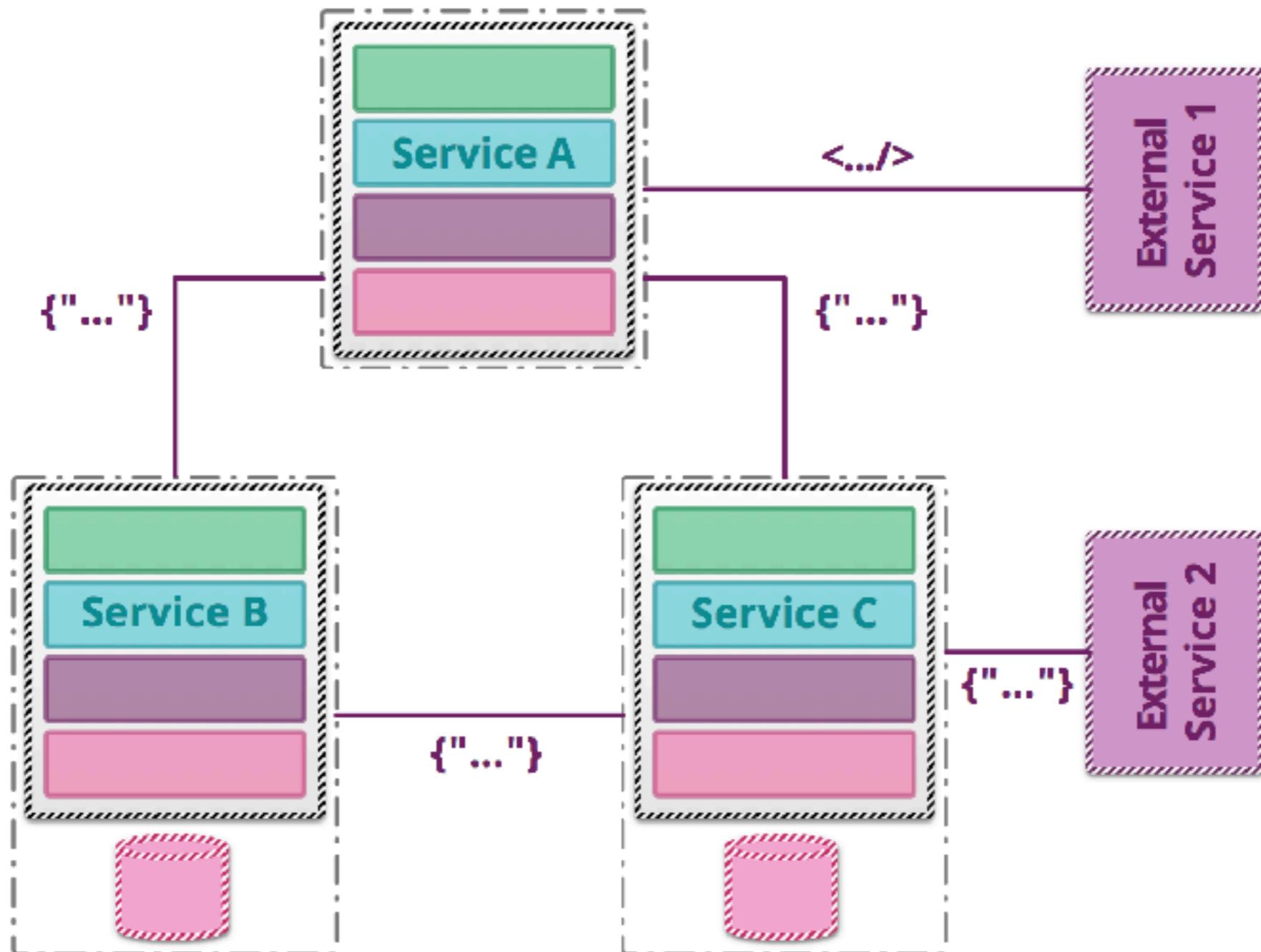
Service structure



<https://martinfowler.com/articles/microservice-testing>



Multiple services

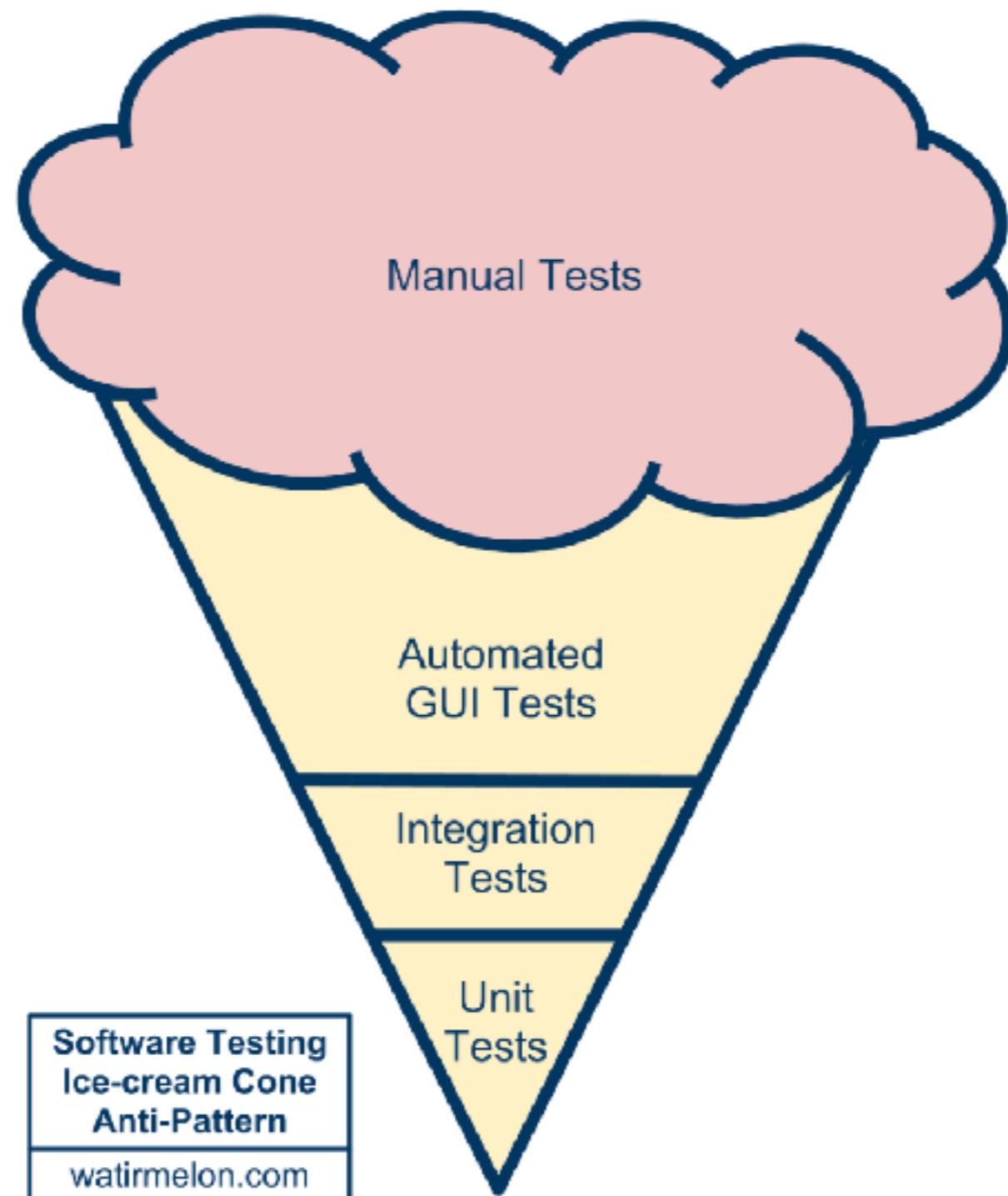


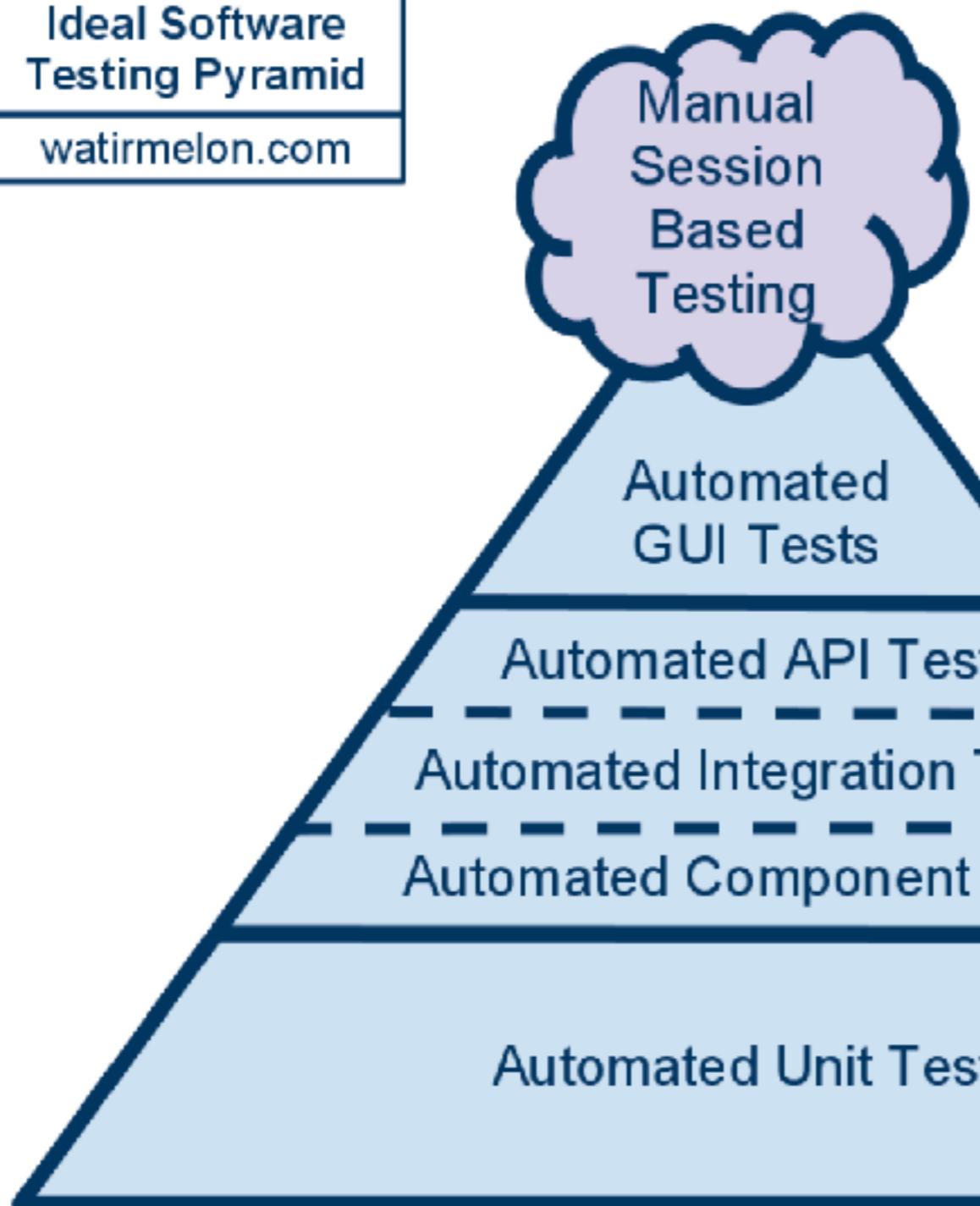
<https://martinfowler.com/articles/microservice-testing>

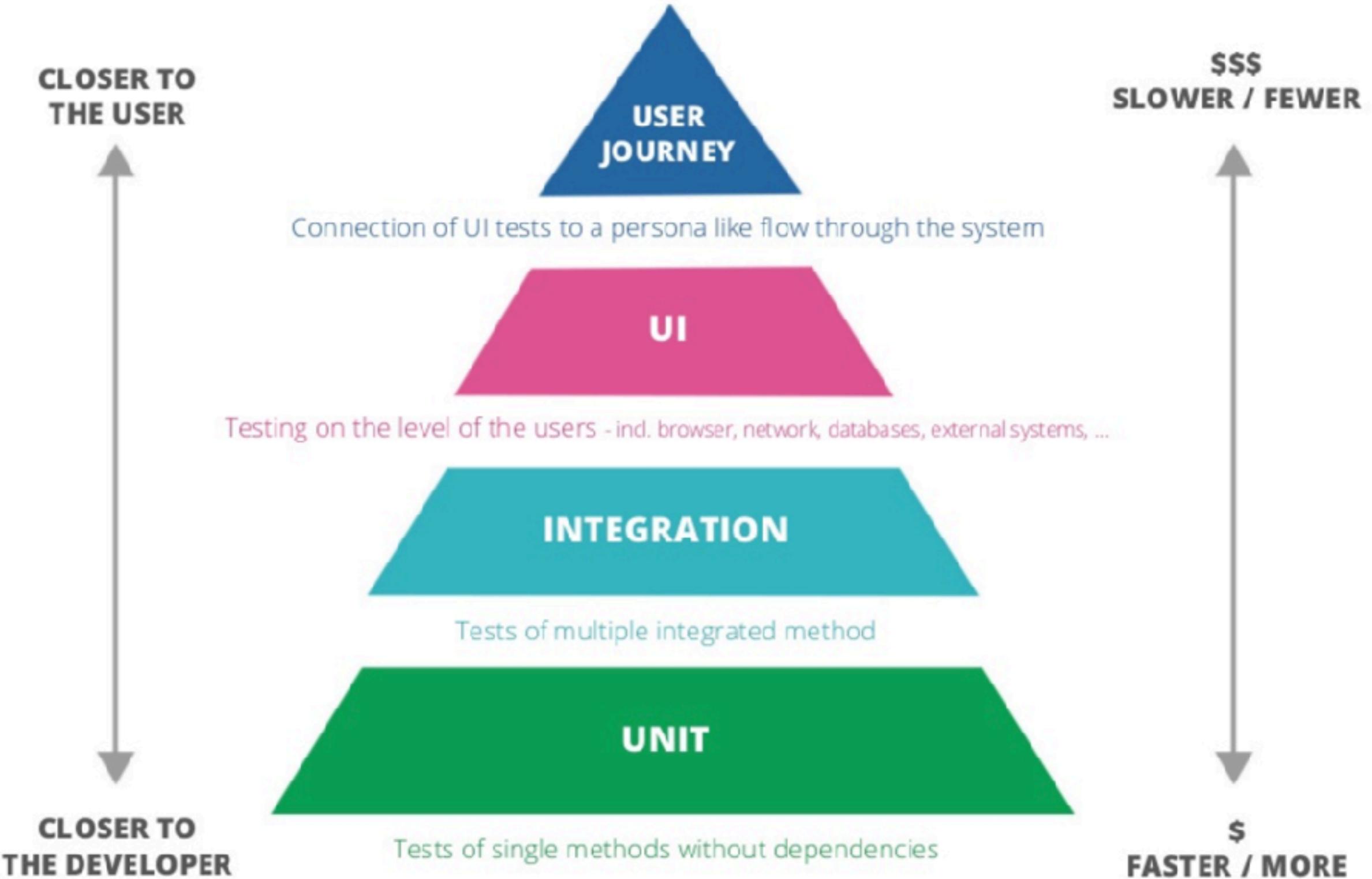


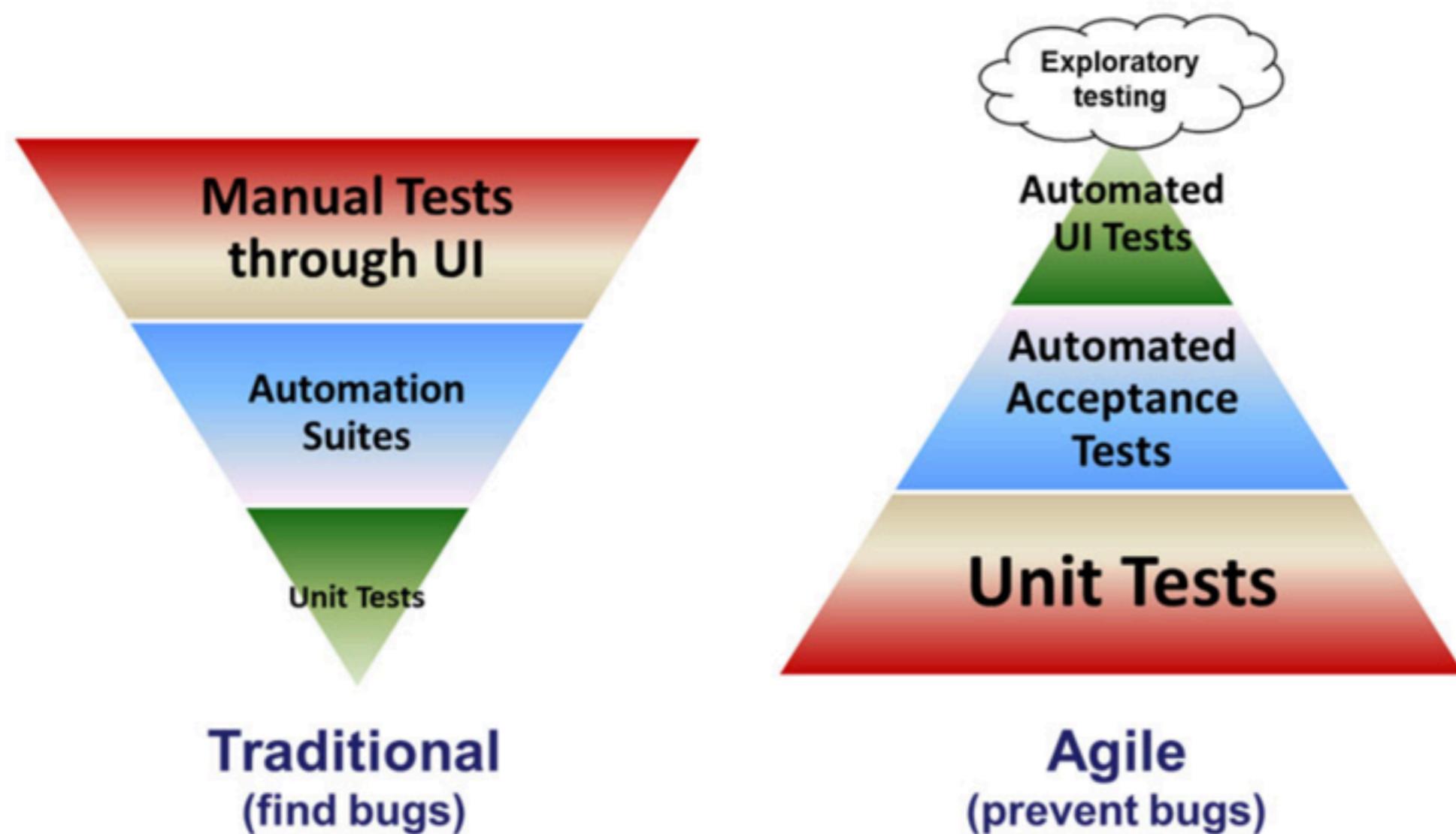
Microservice Testing

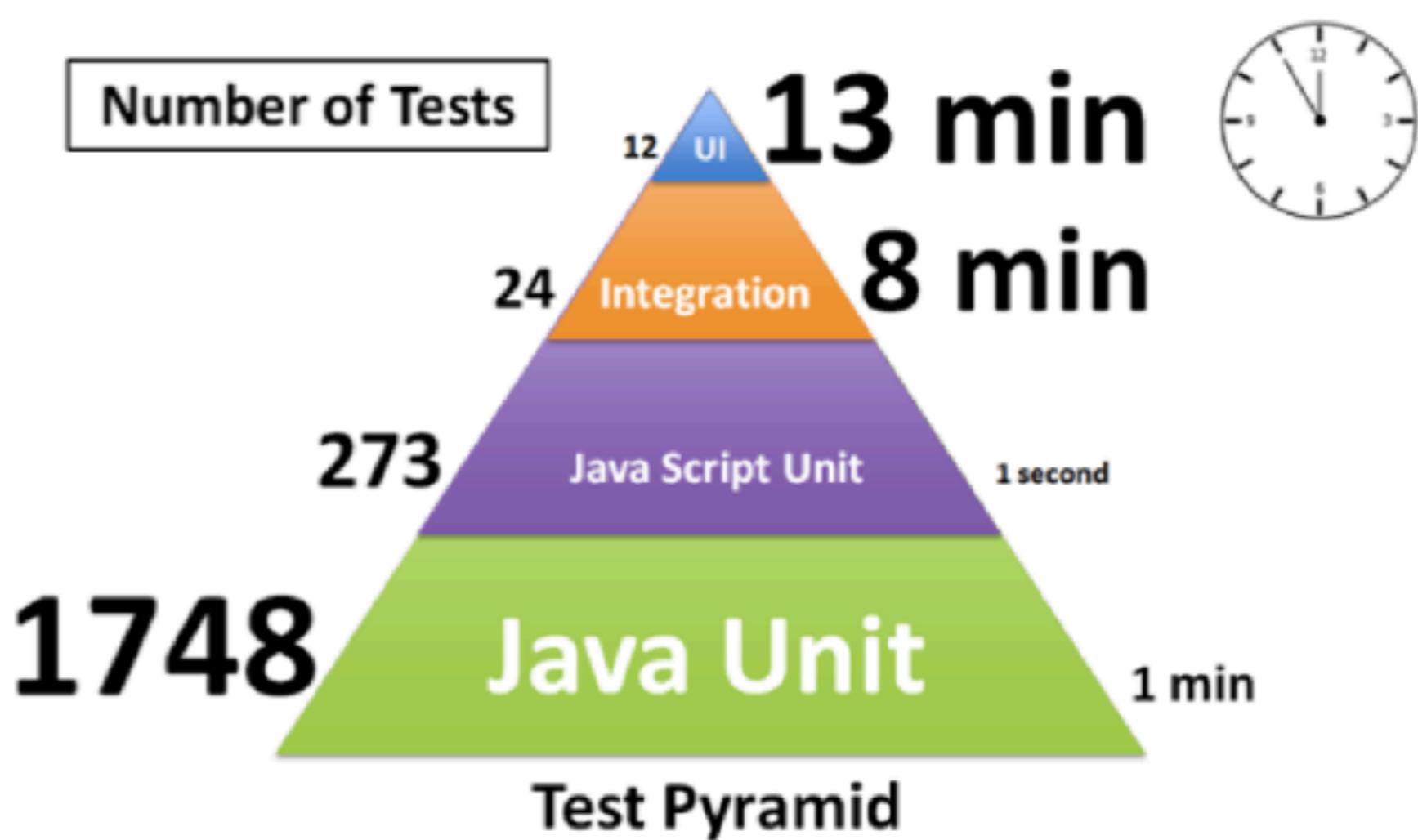






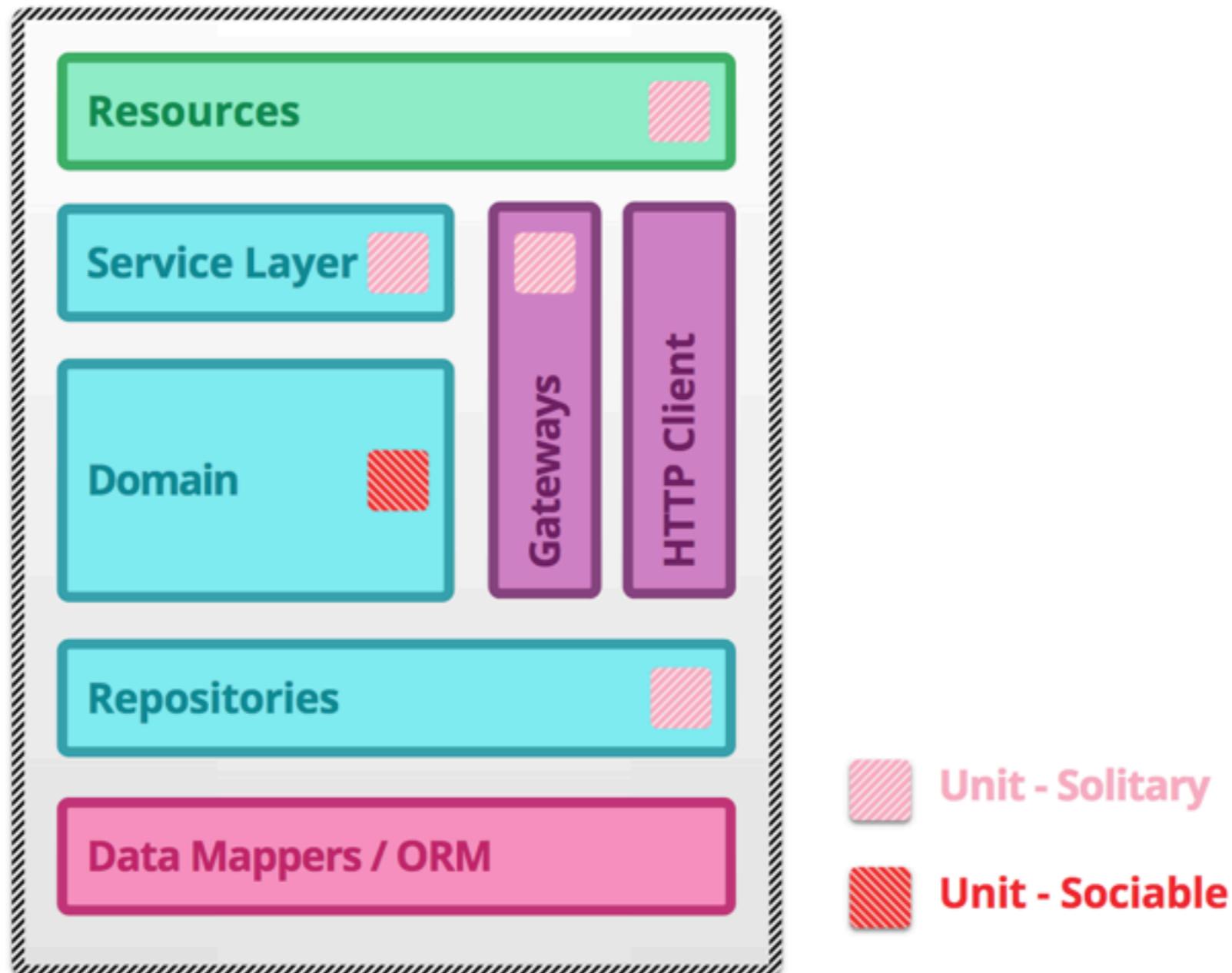




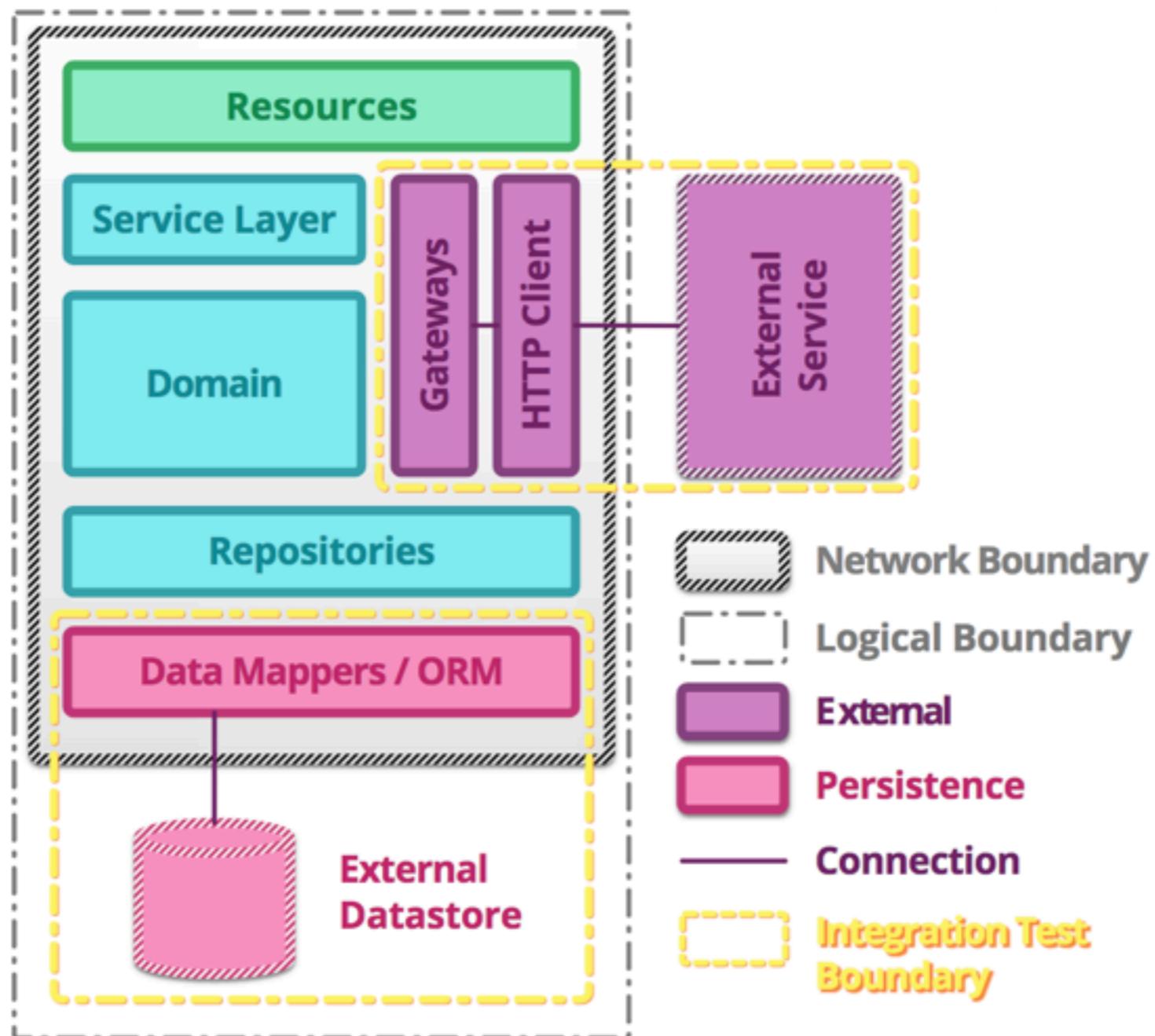




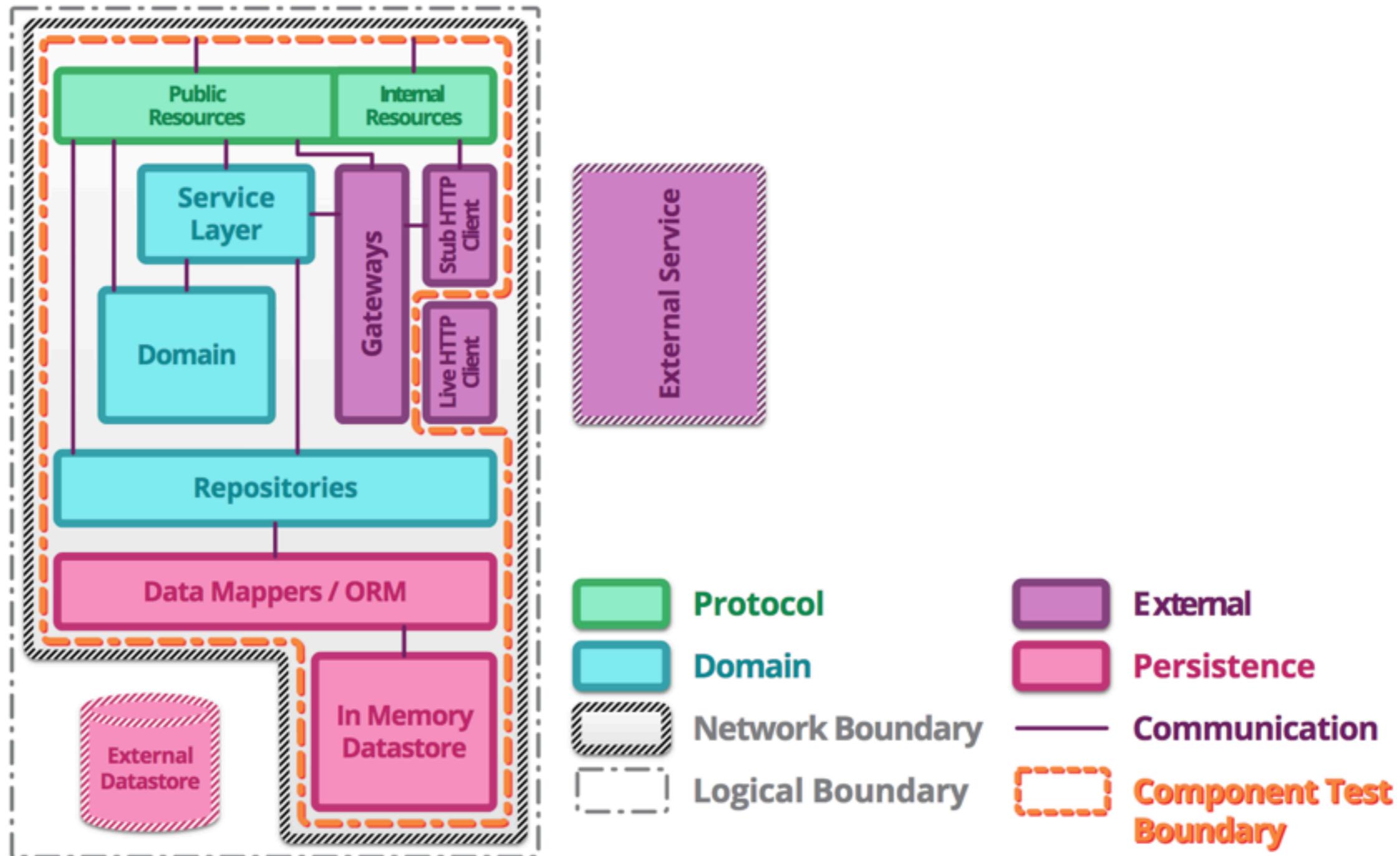
Unit testing



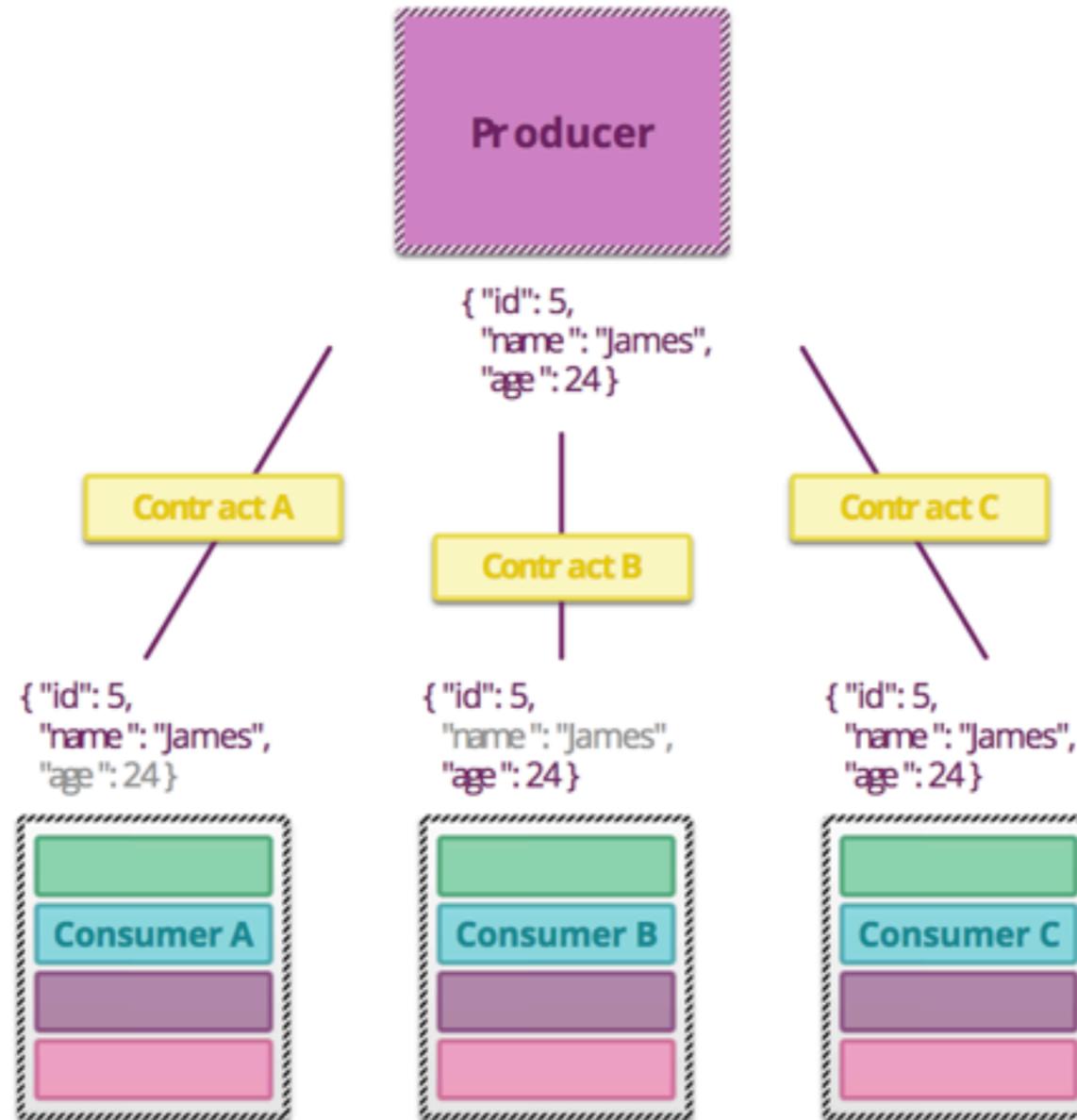
Integration testing



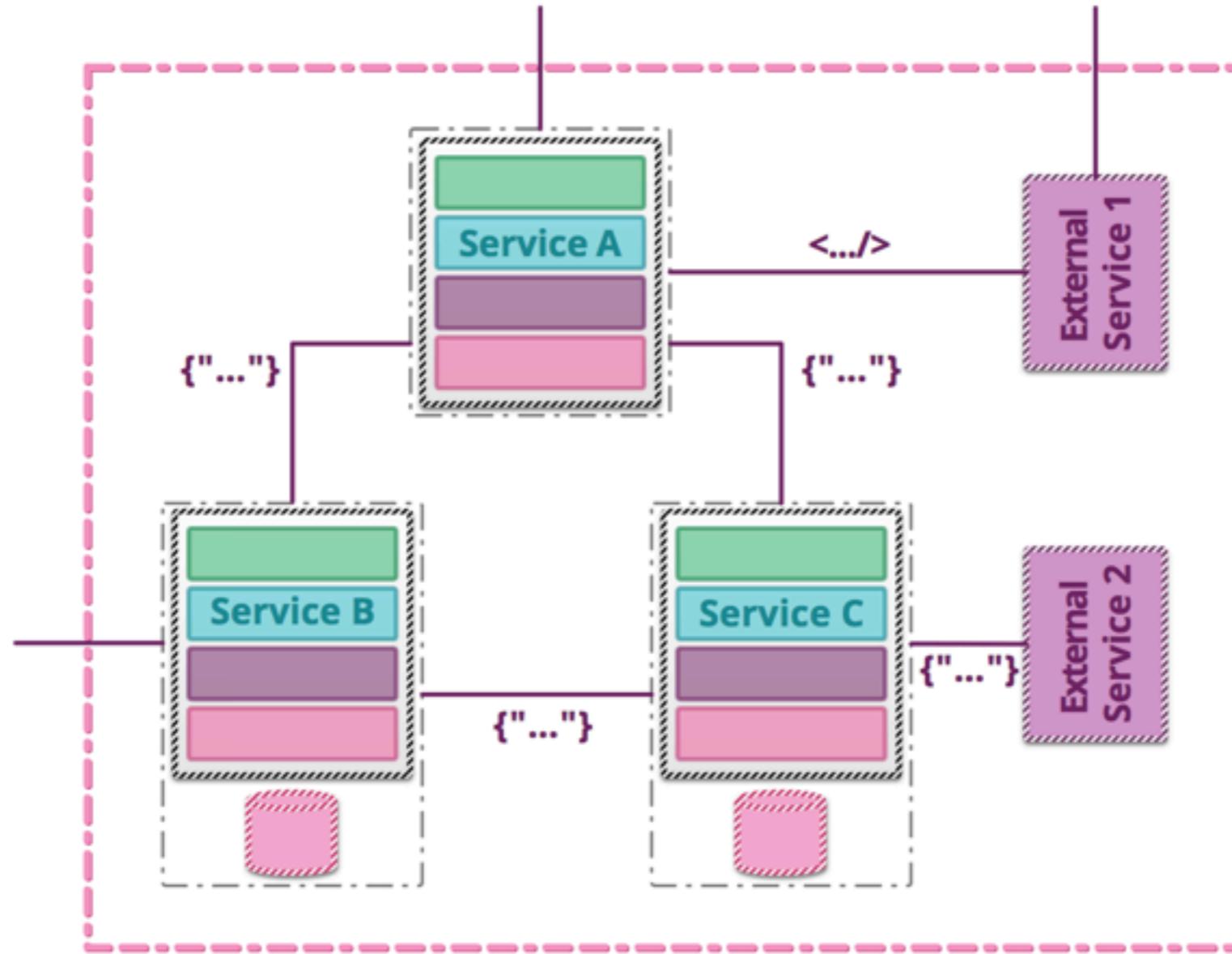
Component testing



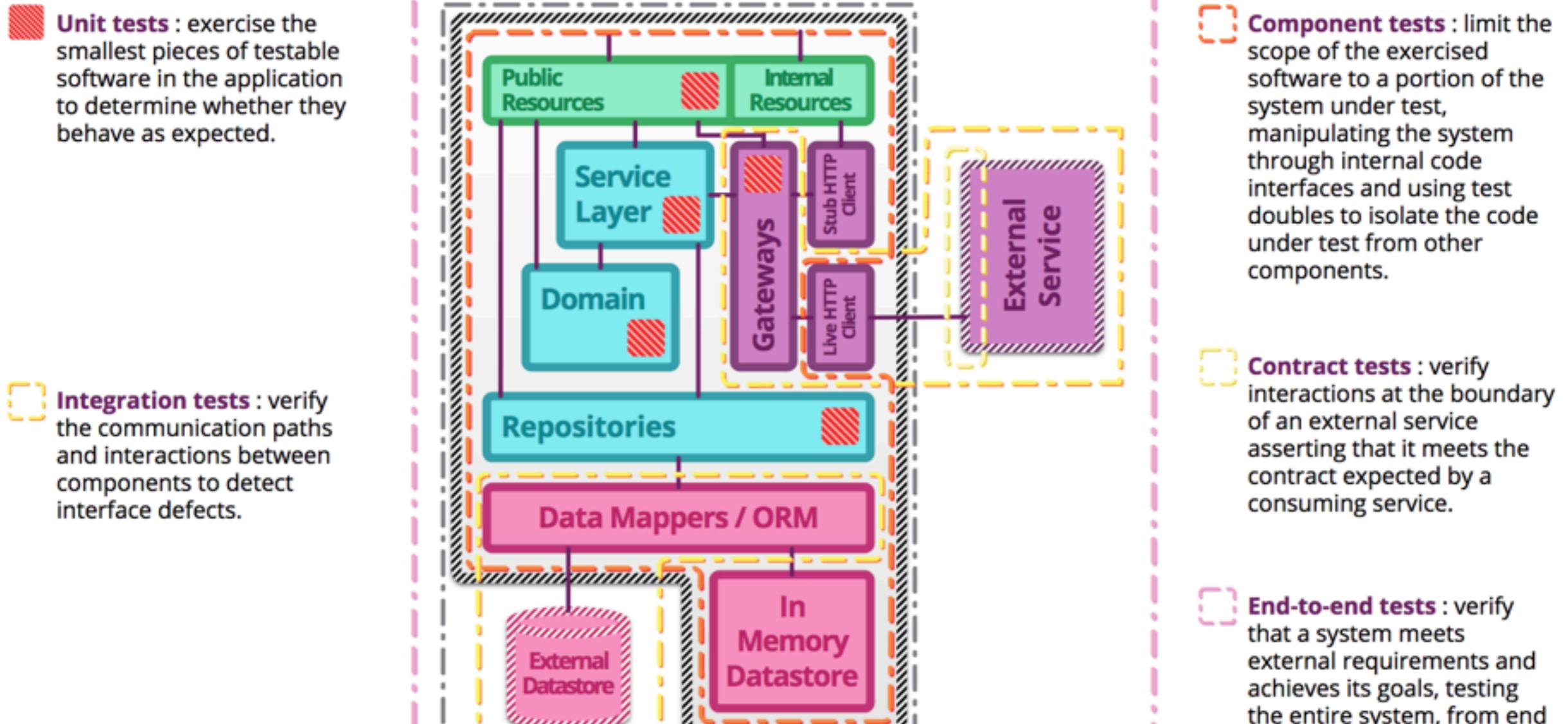
Contract testing



End-to-End testing

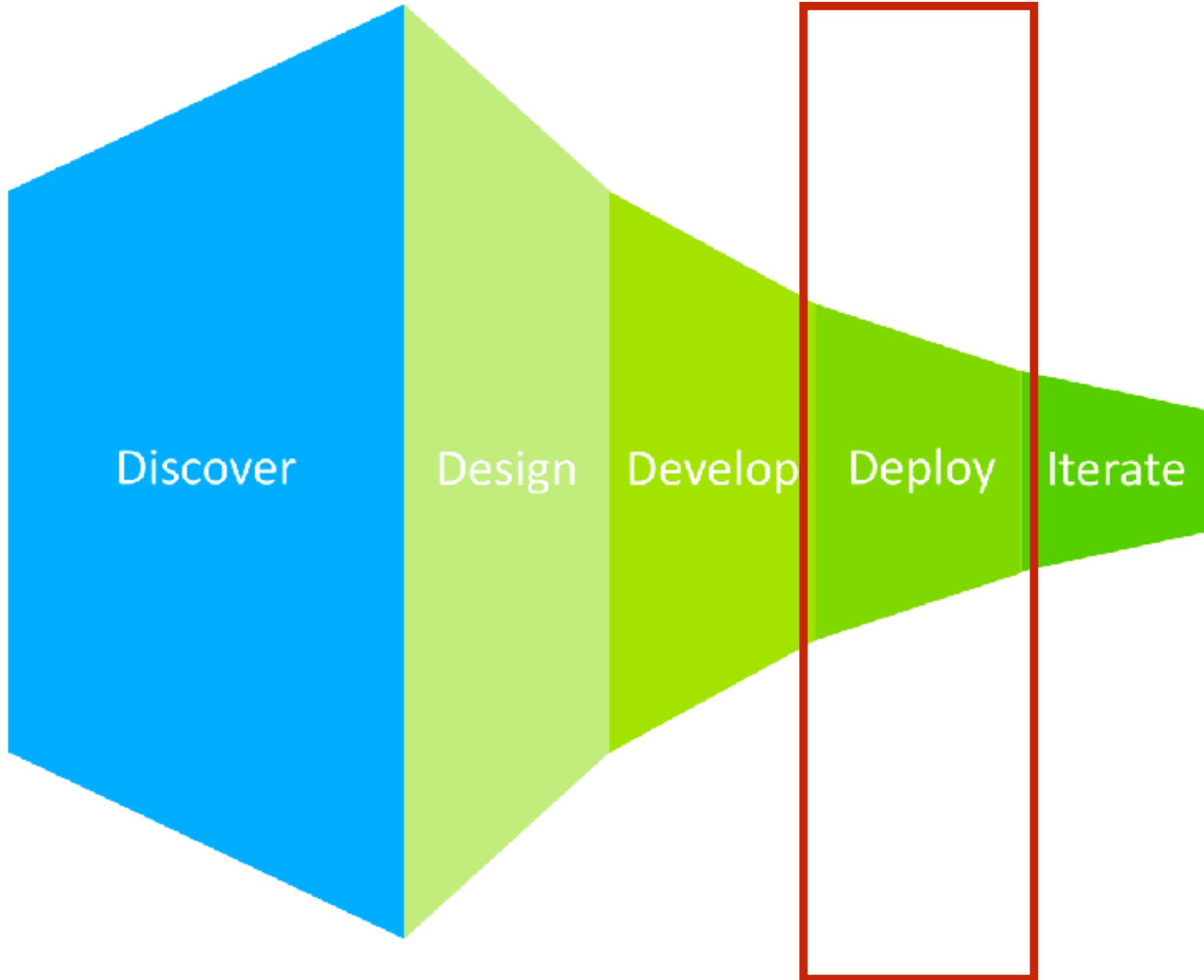


Summary



What is your testing strategy ?





Deployment





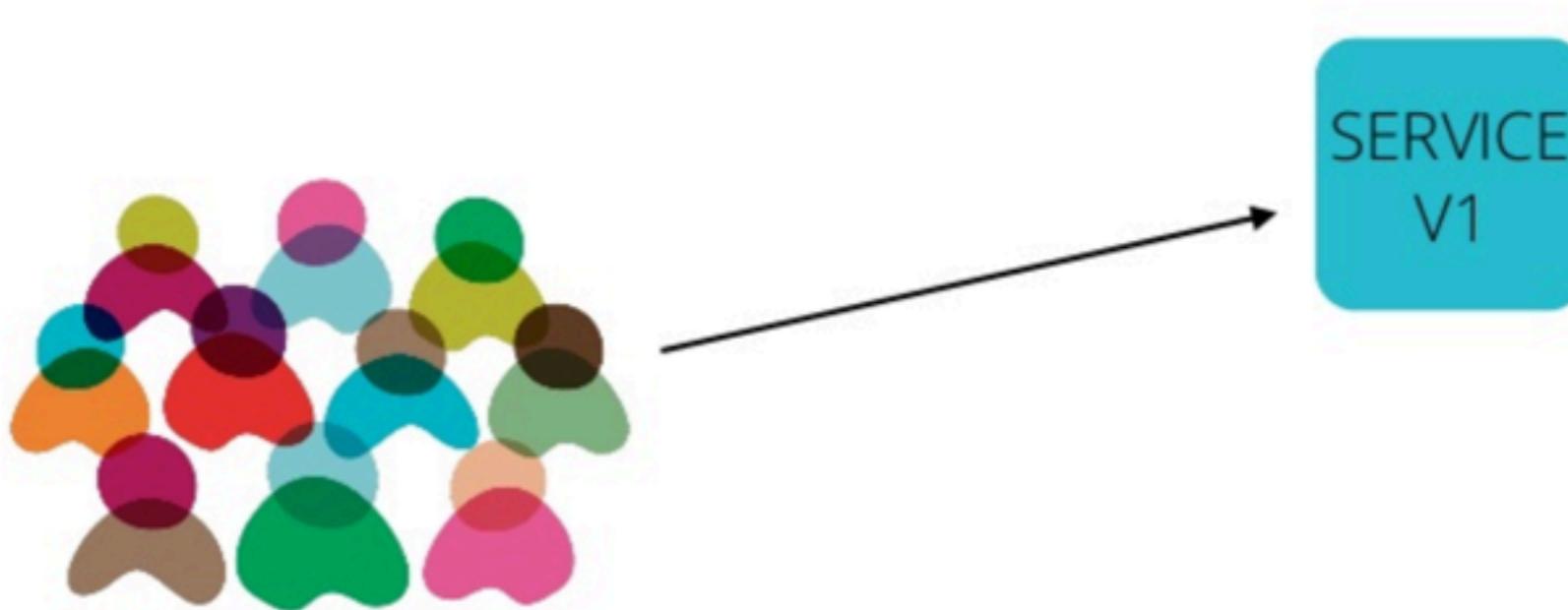
Deploy vs Release



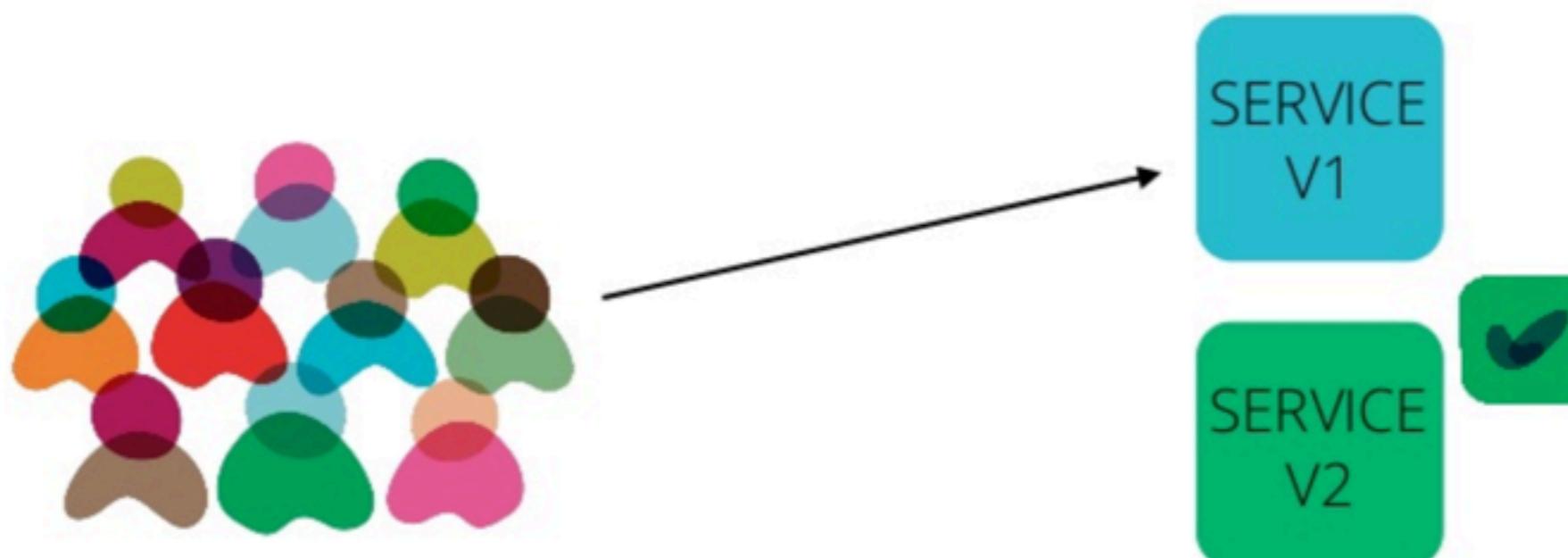
Blue Green Deployment



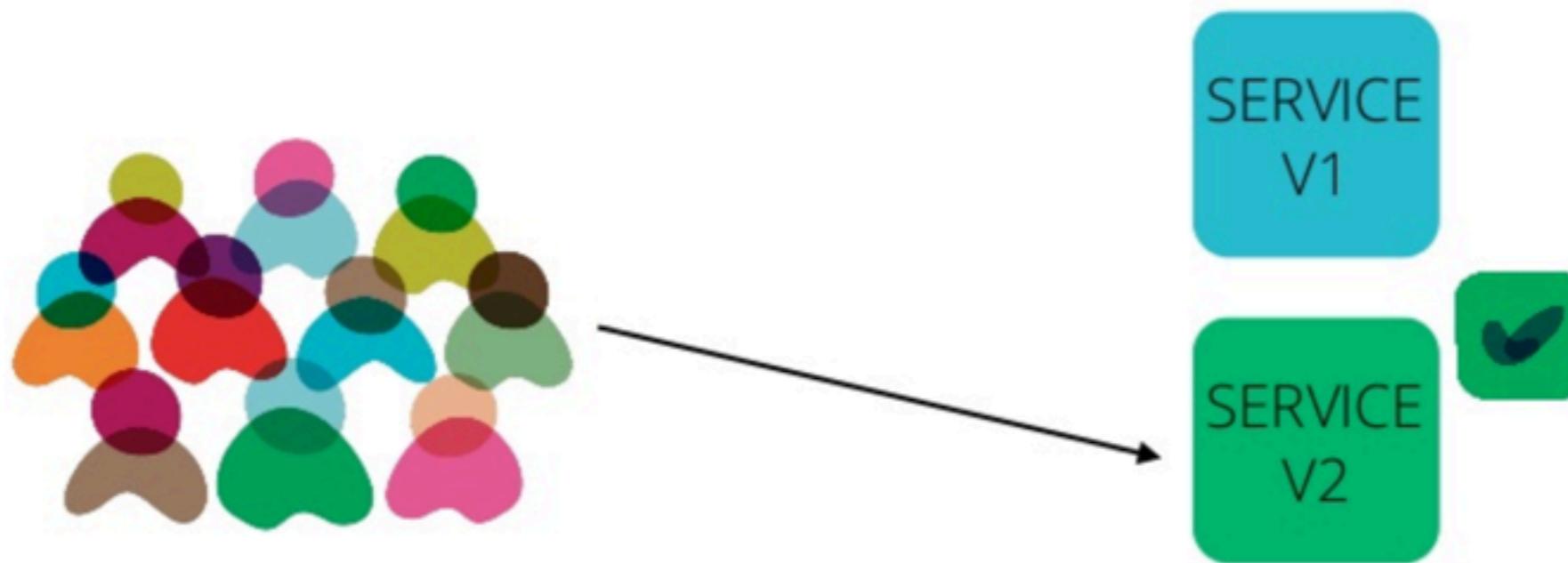
Blue Green Deployment



Blue Green Deployment



Blue Green Deployment



Canary Release



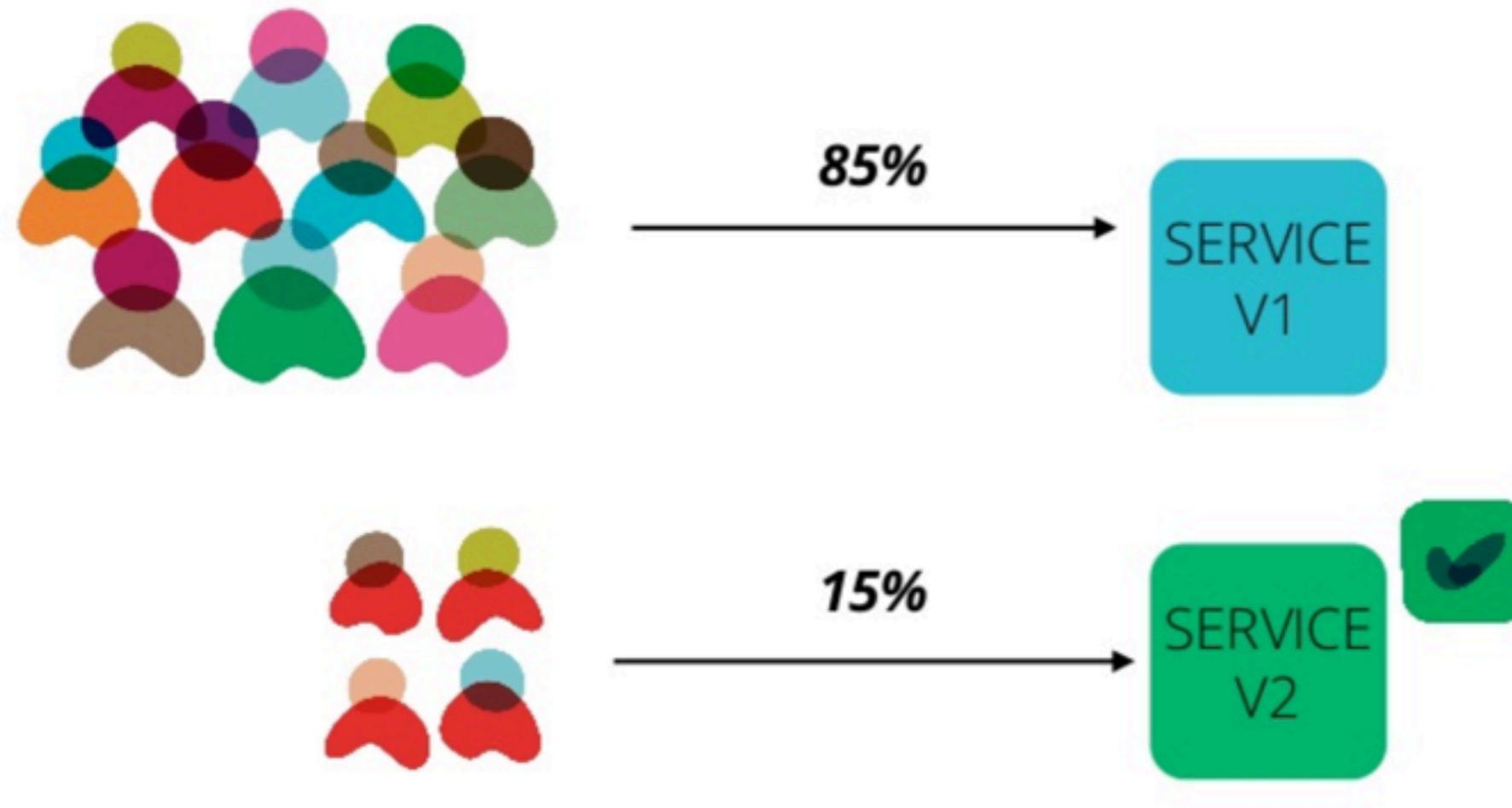
Canary Release



Canary Release



Canary Release



Mean Time to Recover (MTTR)



Mean Time to Recover (MTTR)

Tests are very important to reduce amount of defects in your systems. However, it's important to acknowledge that bugs will always happen in production.



Mean Time to Recover (MTTR)

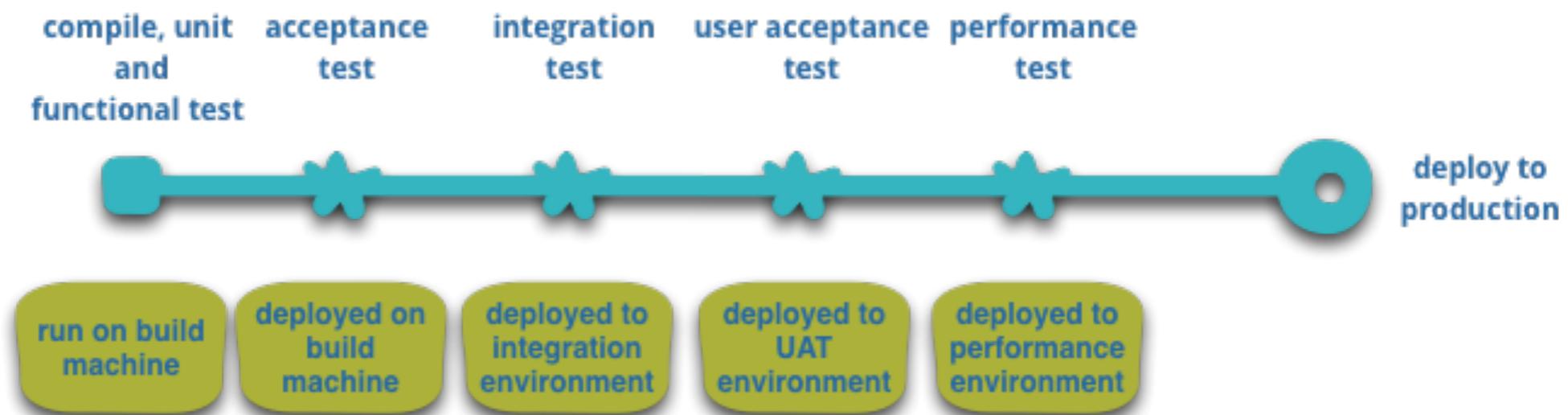
How **fast** to recover from them will help determining our success !



Current situation !!

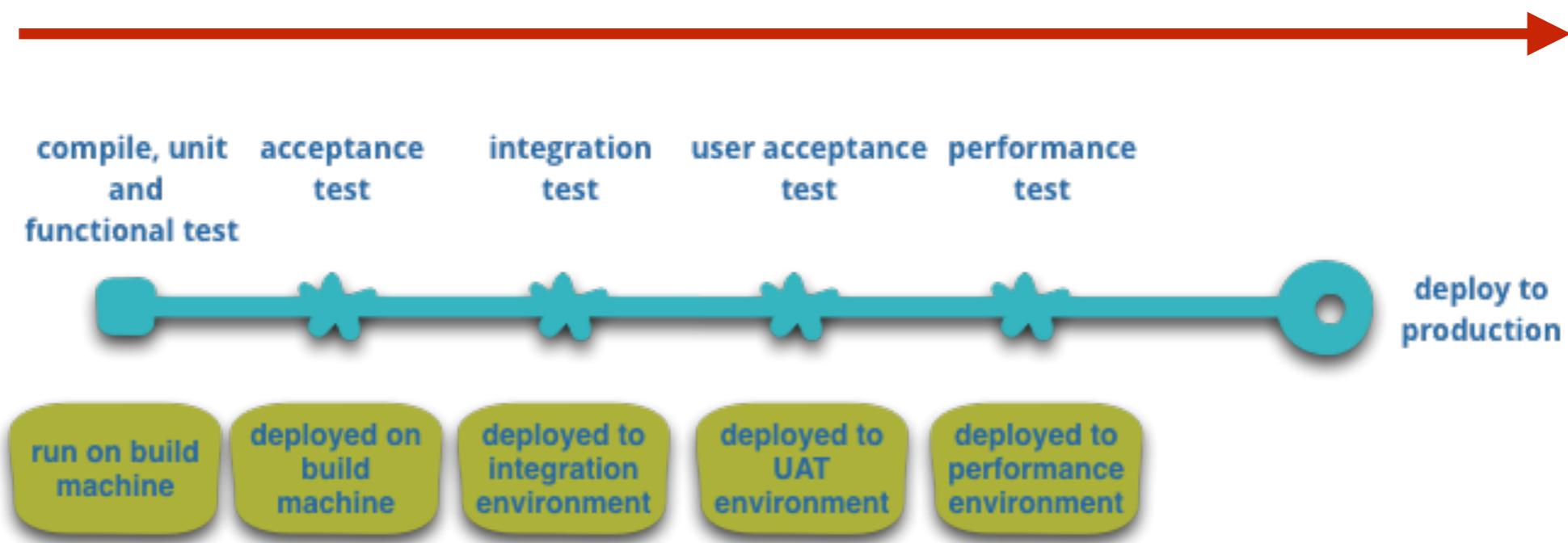


Infrastructure Automation

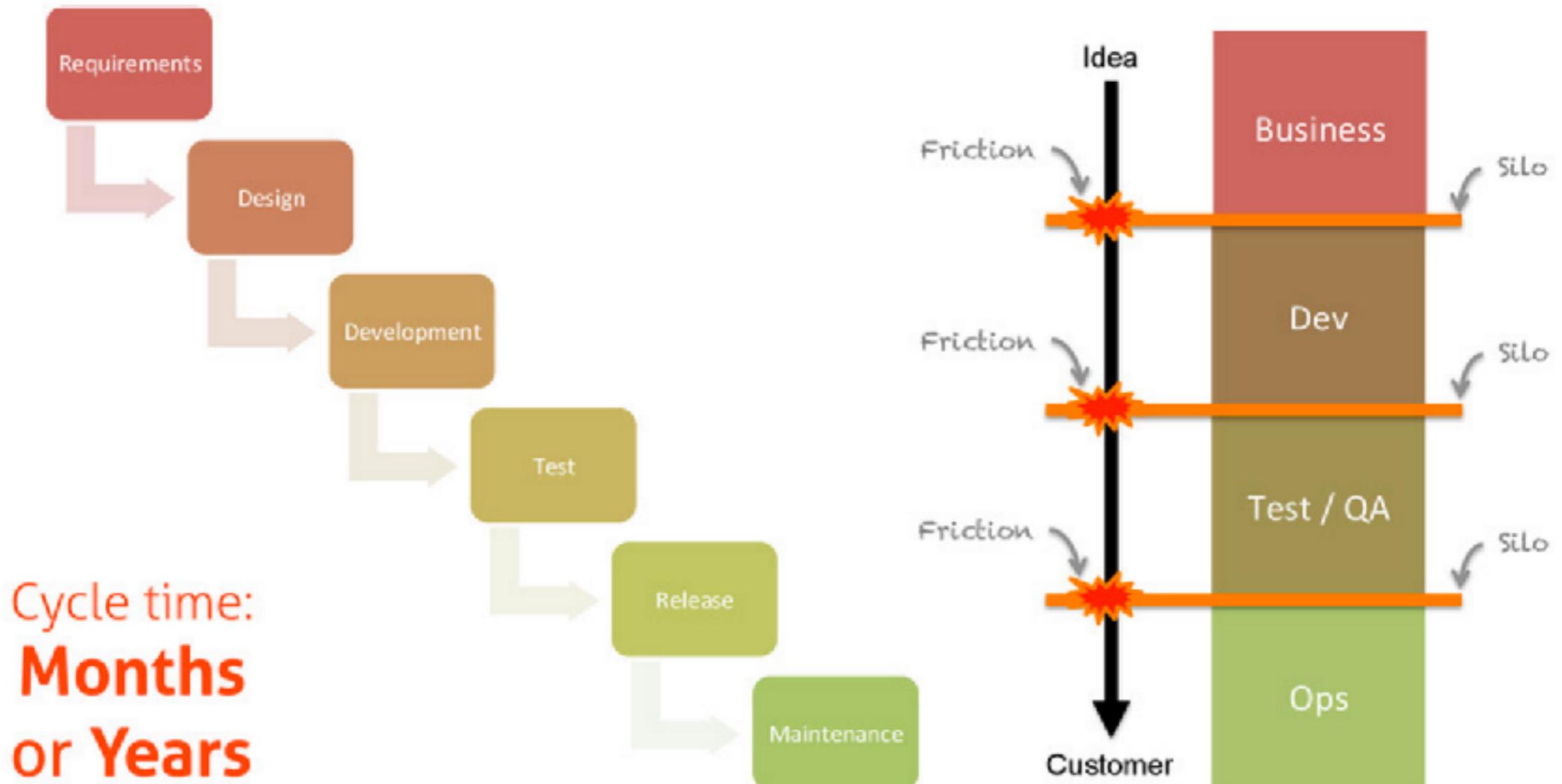


Infrastructure Automation

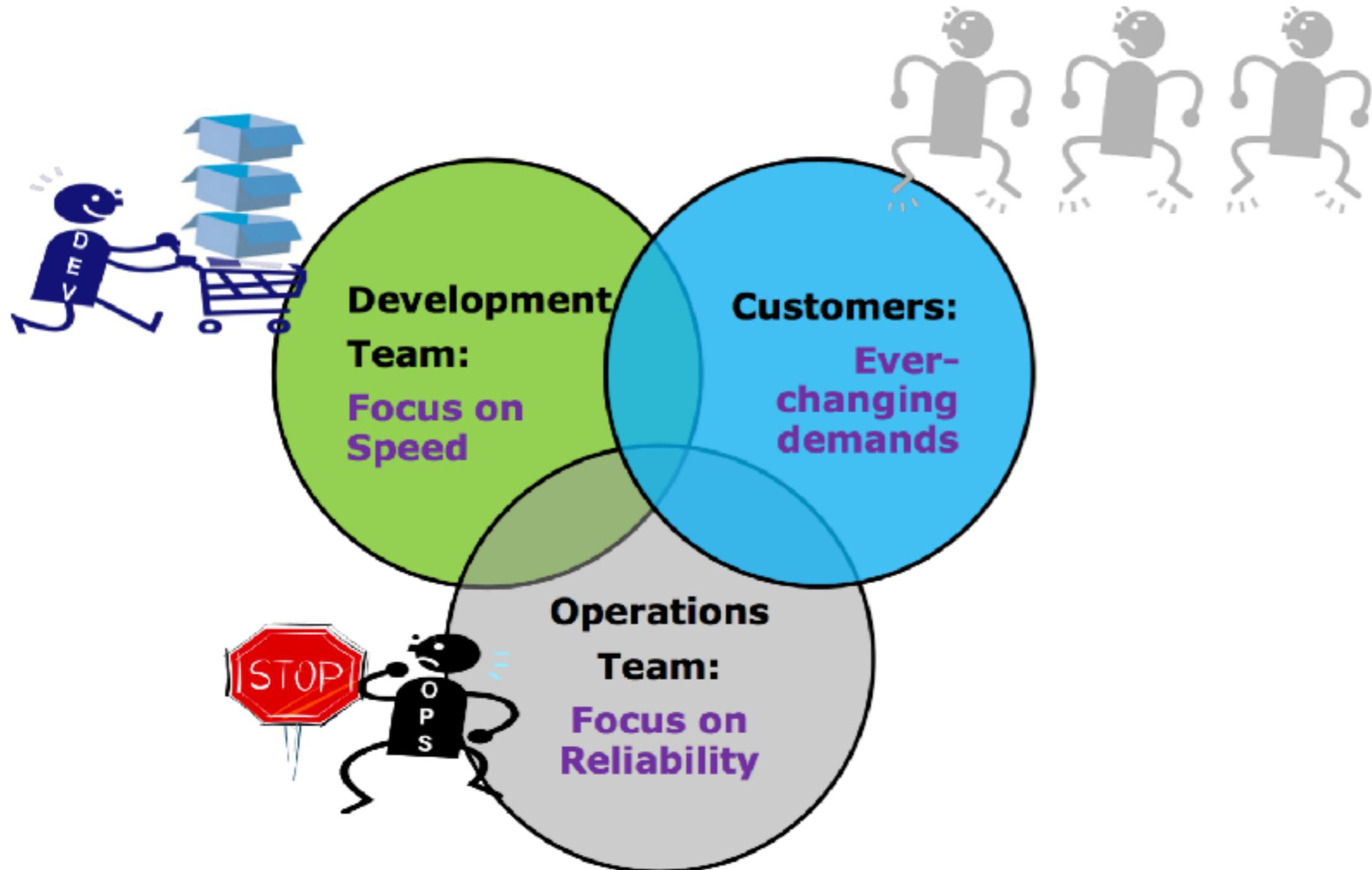
Lead time ?



Traditional development



Conflict of Interest



Conflict of Interest

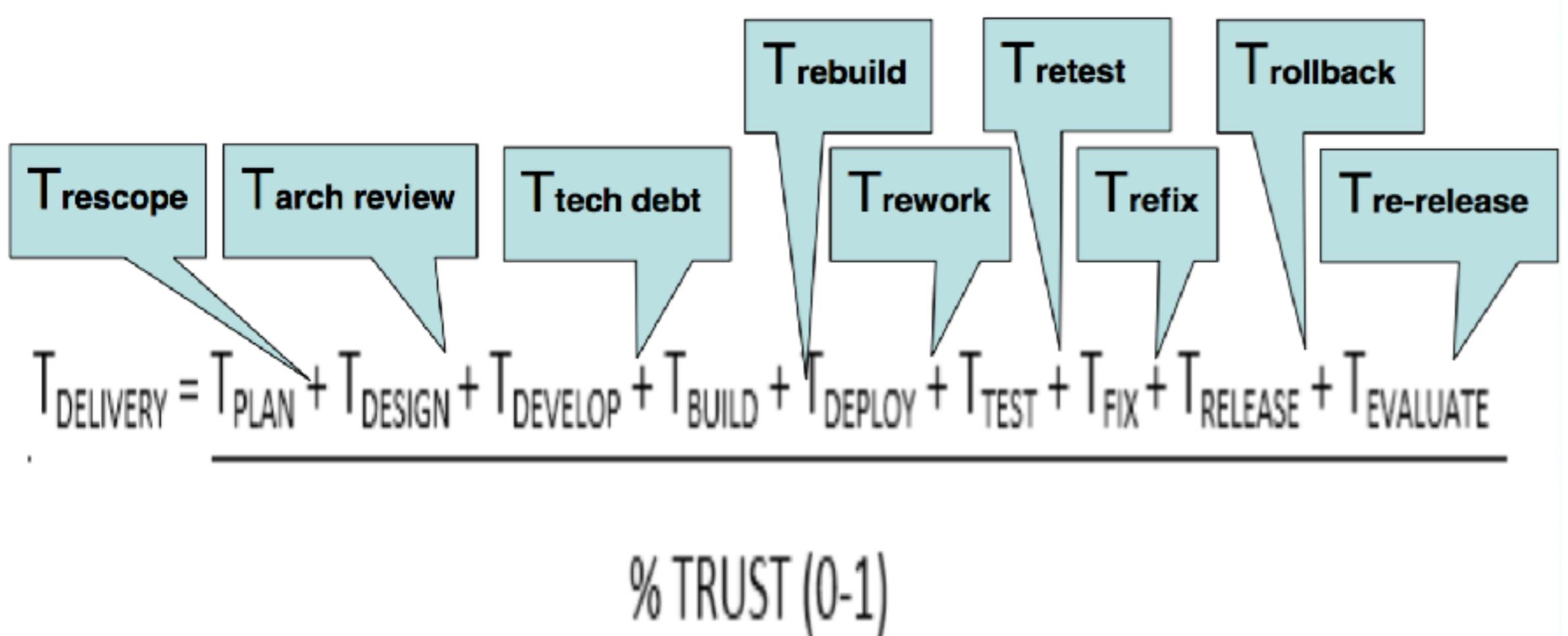


Conflict of Interest

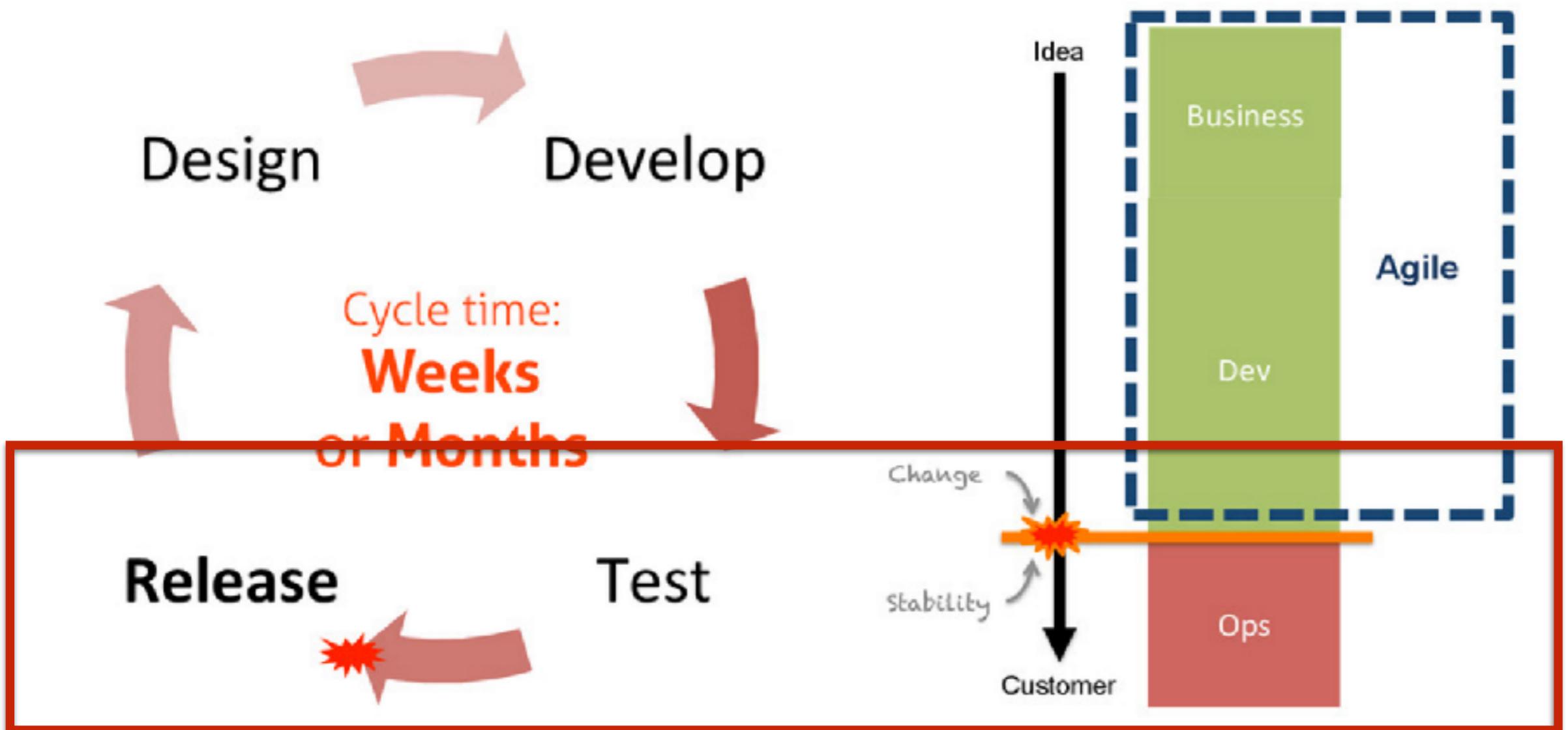




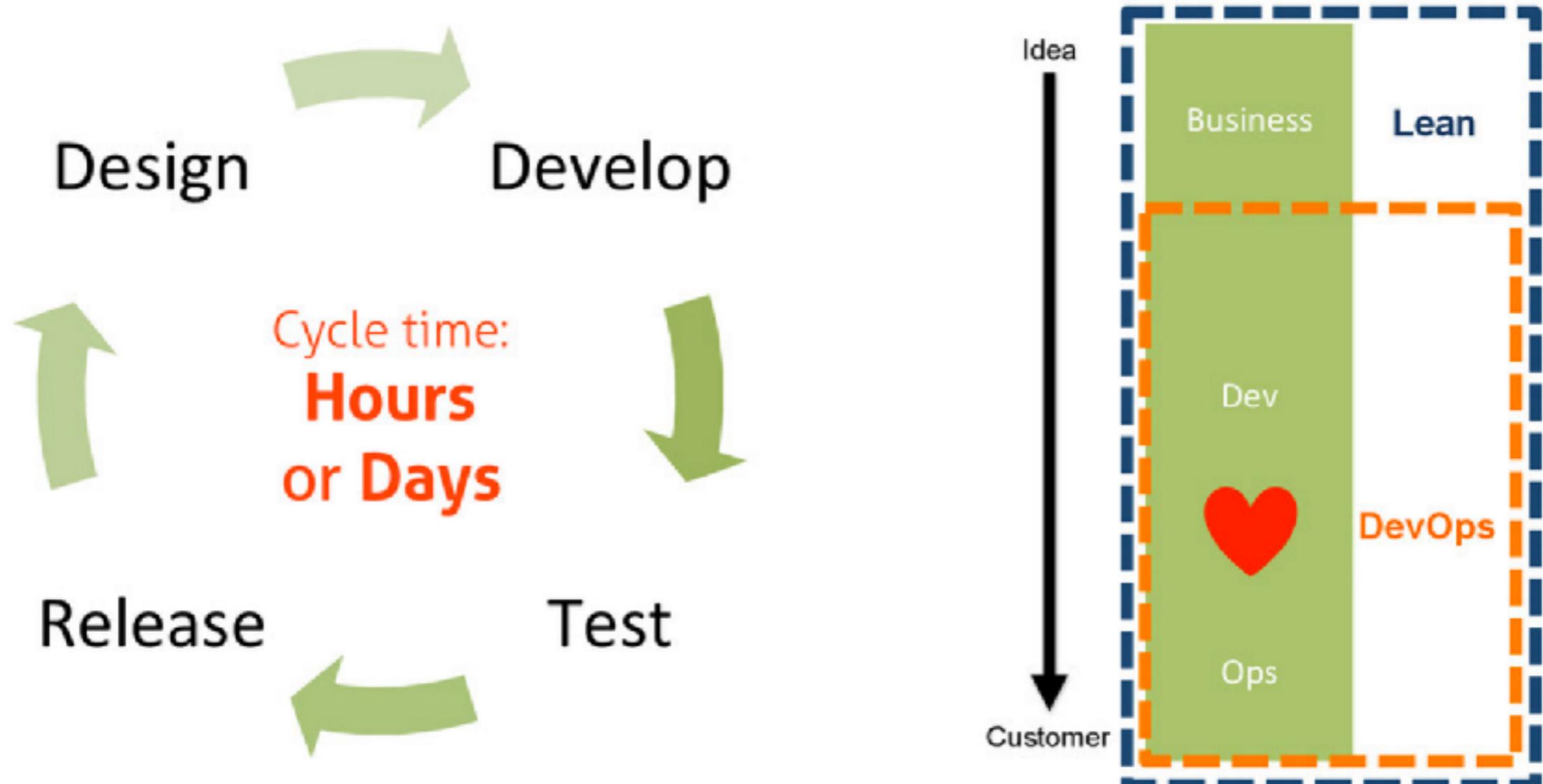
Low trust create extra steps

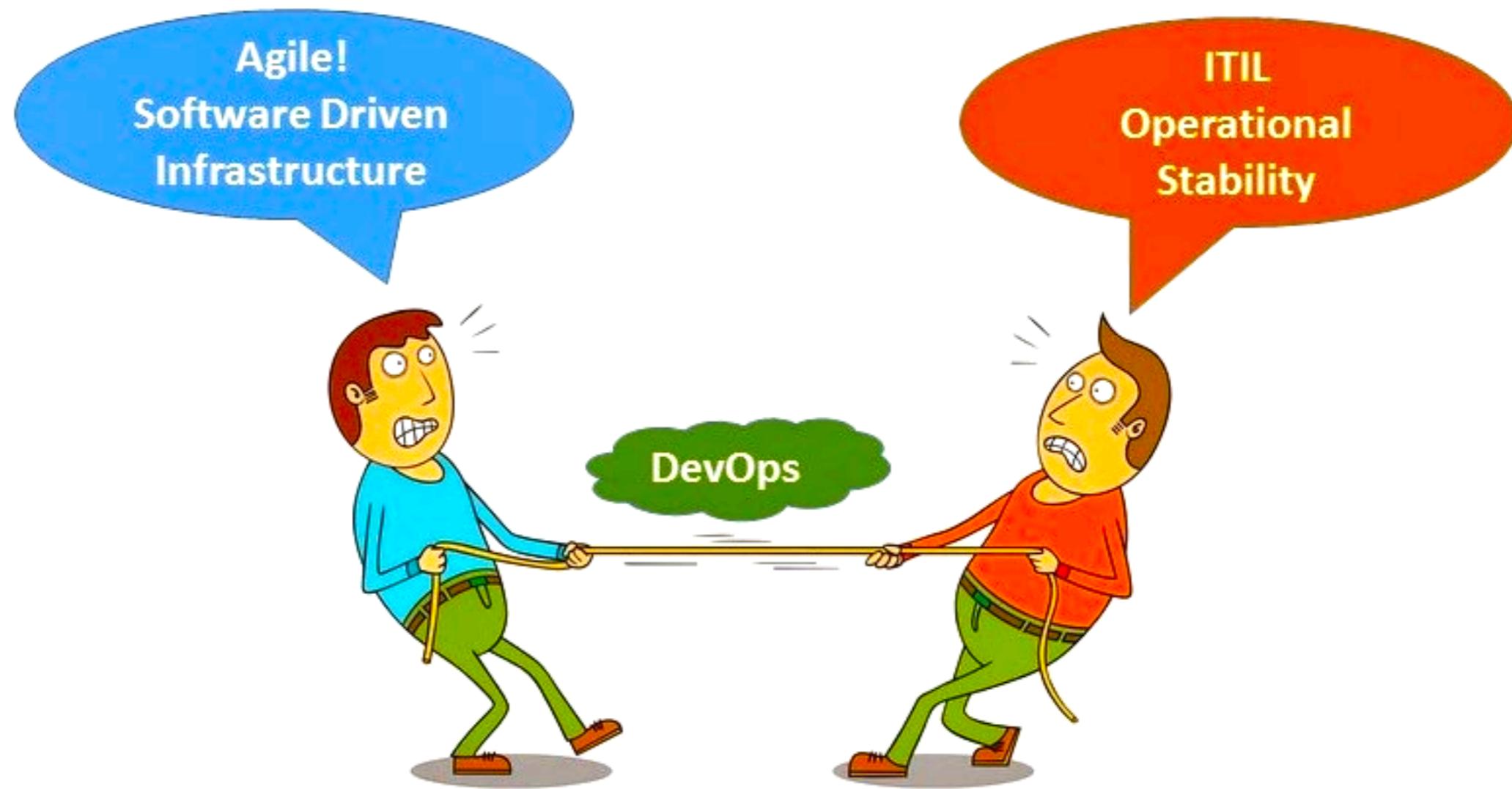


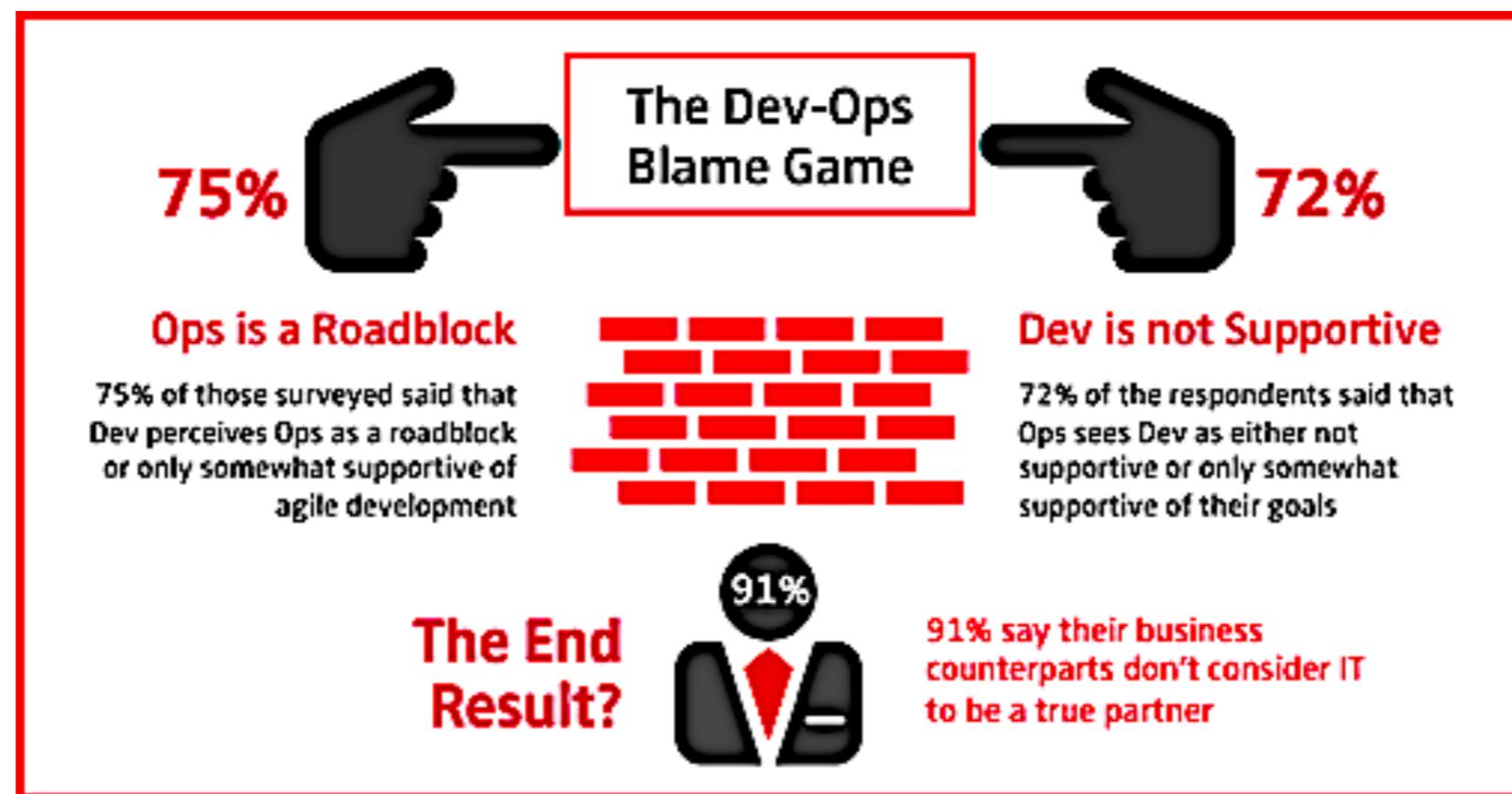
Iterative/Agile development

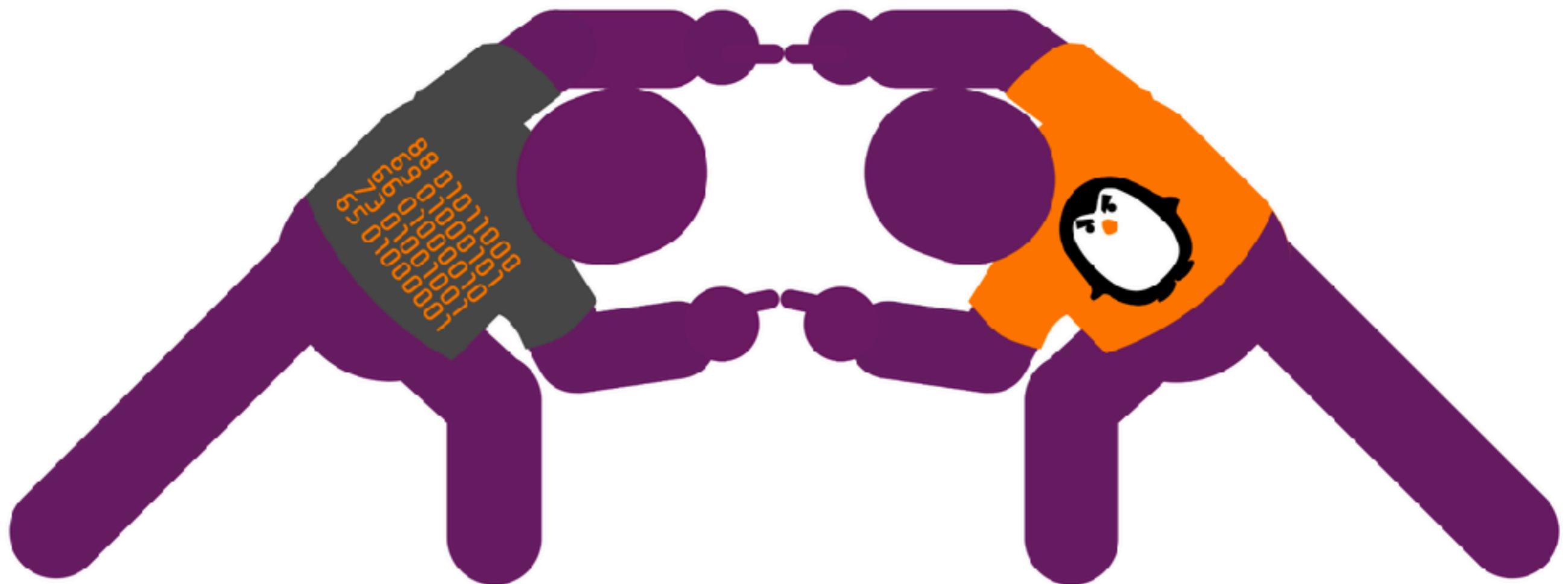


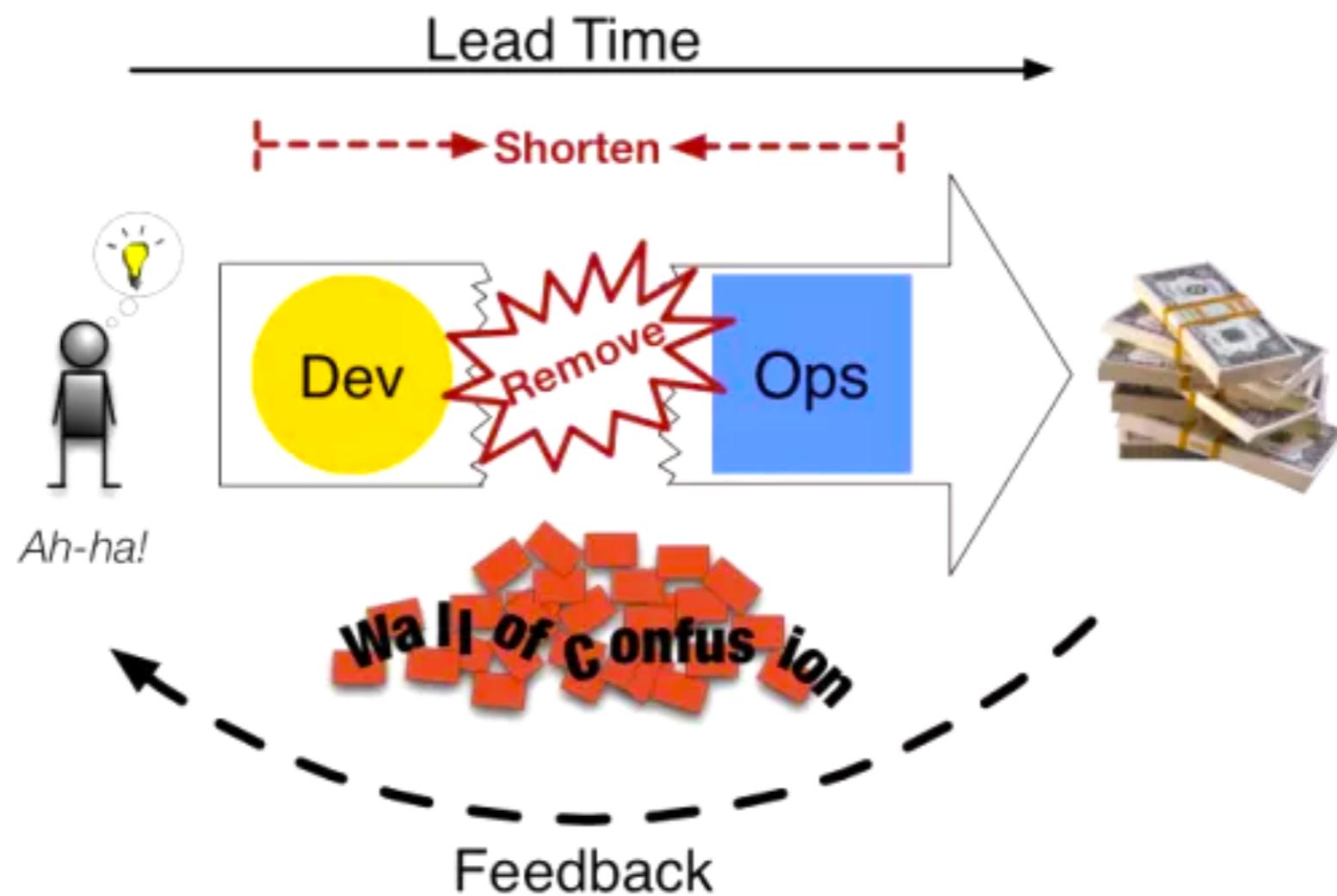
Rise of DevOps

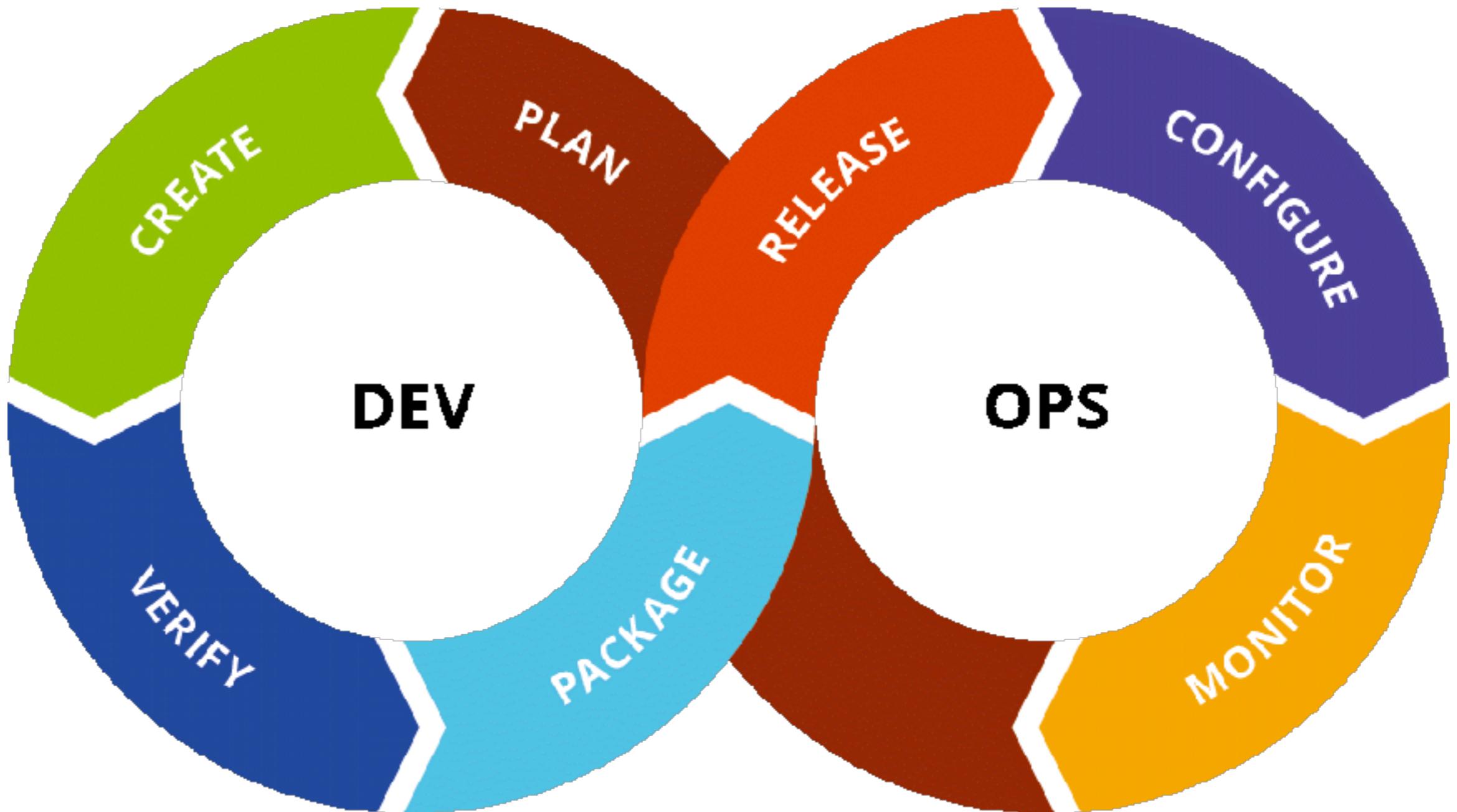












DEV

OPS

 **Application Performance**

Decrease latency by using APM Tools.

 **End User Analytics**

Monitor end user latency and check device performance

 **Quality Code**

Ensure deployments don't degrade performance

 **Code-Level Errors**

Lower MTTR by finding error root causes



 **Application Availability**

Make sure Uptime and SLAs are in order

 **Application Performance**

Solve problems by correlating infrastructure and application metrics

 **End User Complaints**

Fix problems before end users complain

 **Performance Analytics**

Use automatically generated baselines to focus troubleshooting



DevOps ?

"DevOps is
development
and operations
collaboration"

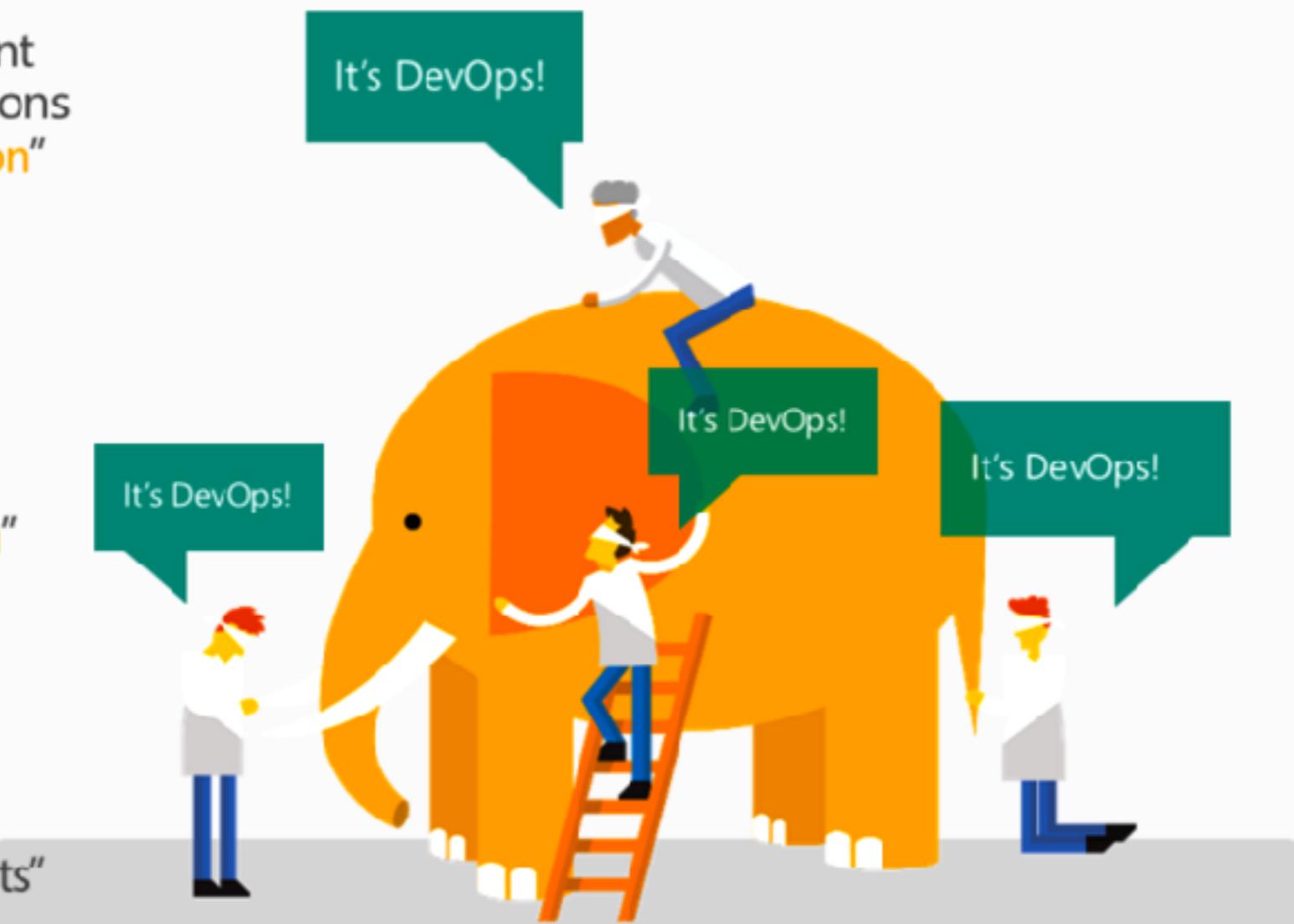
"DevOps
is using
automation"

"DevOps
is **small**
deployments"

"DevOps is
treating your
infrastructure
as code"

"DevOps
is feature
switches"

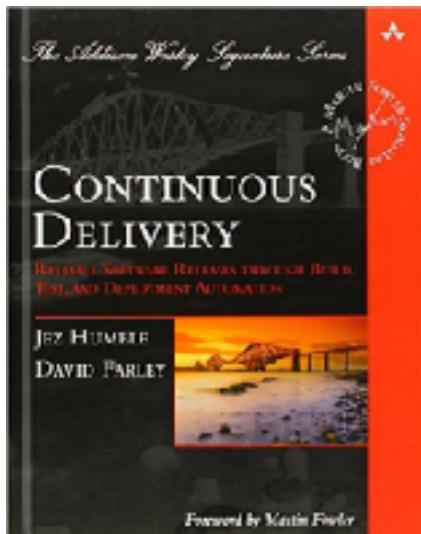
"Kanban
for Ops?"



DevOps ?

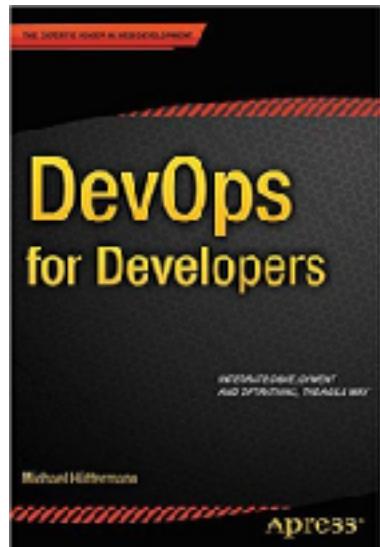
“A movement of people who care about developing and operating reliable, secure, high performance systems at scale.”

- Jez Humble -



DevOps ?

“A mix of patterns intended to **improve collaboration** between development and operations. DevOps addresses **shared goals and incentives** as well as **shared processes and tools.**”

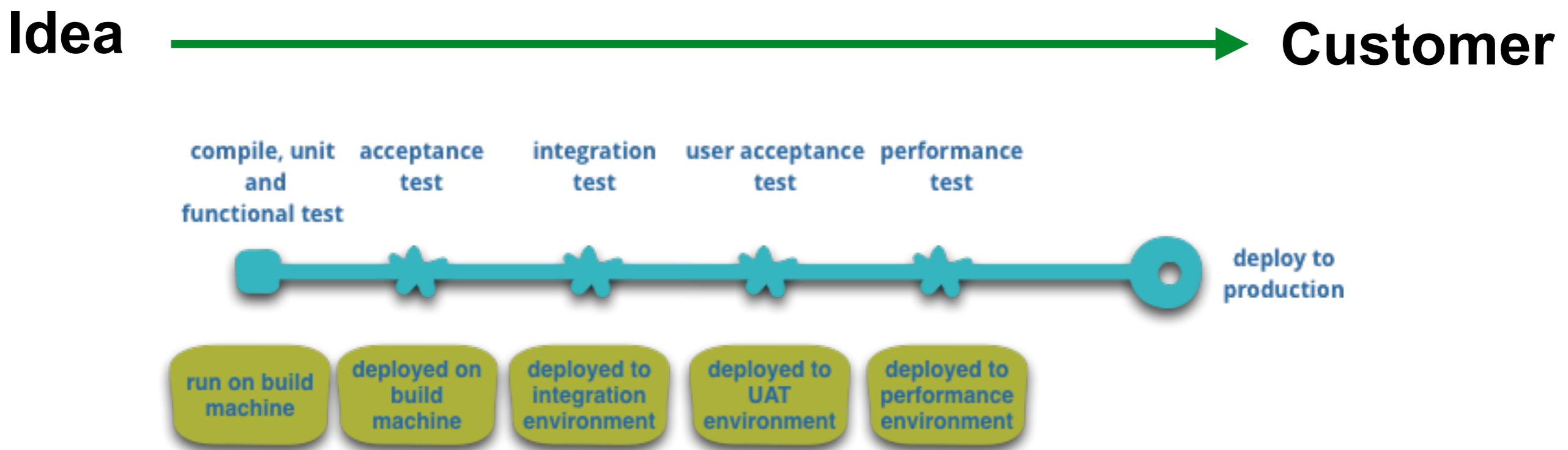


- Michael Huttermann -

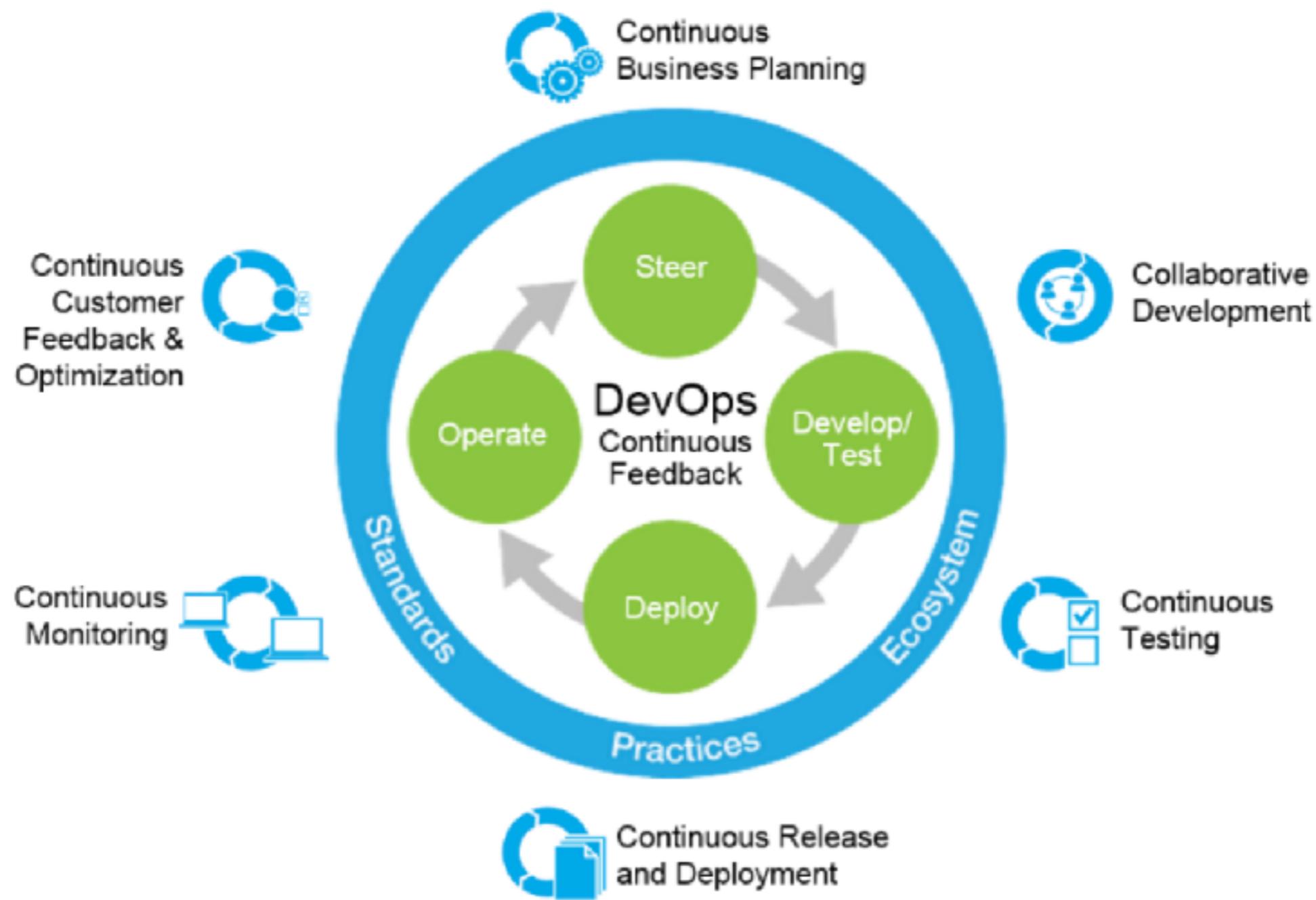


Goal of DevOps

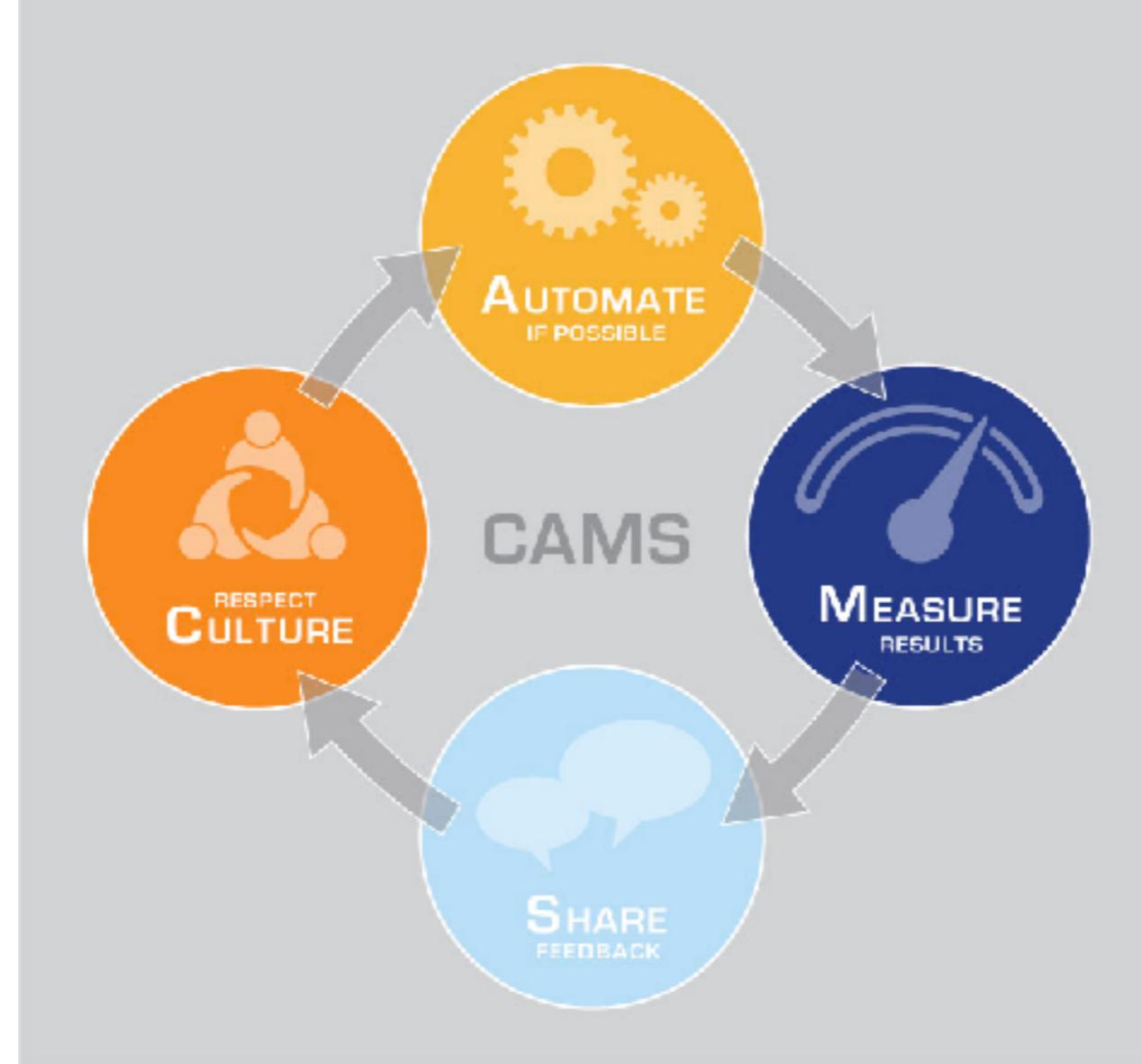
“Improve the delivery of value for Customer and Business”



DevOps Life Cycle



DevOps Principles



DevOps Principles

Culture => People, Process, Tools

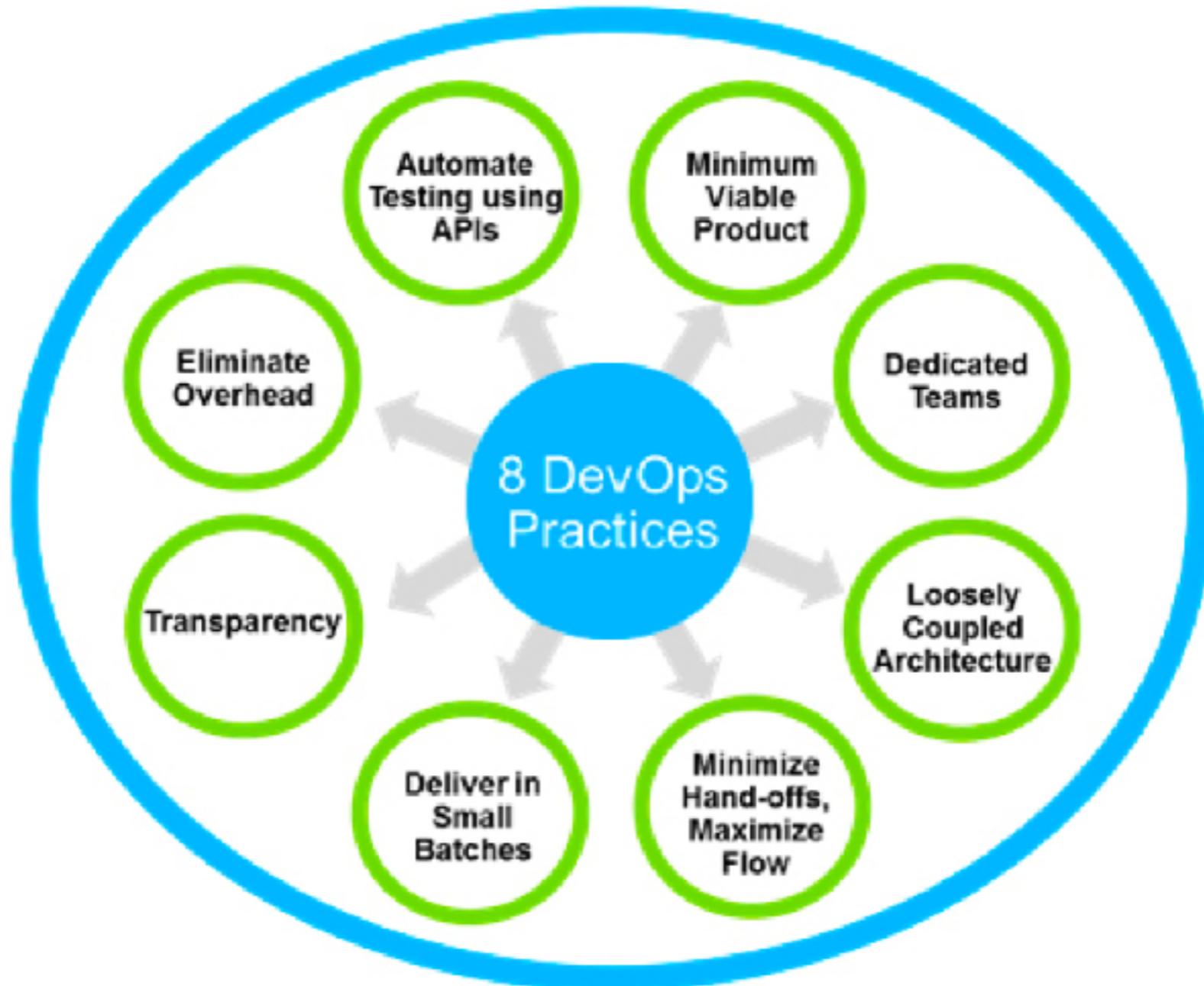
Automation => Infrastructure as Code

Measurement => Measure everything

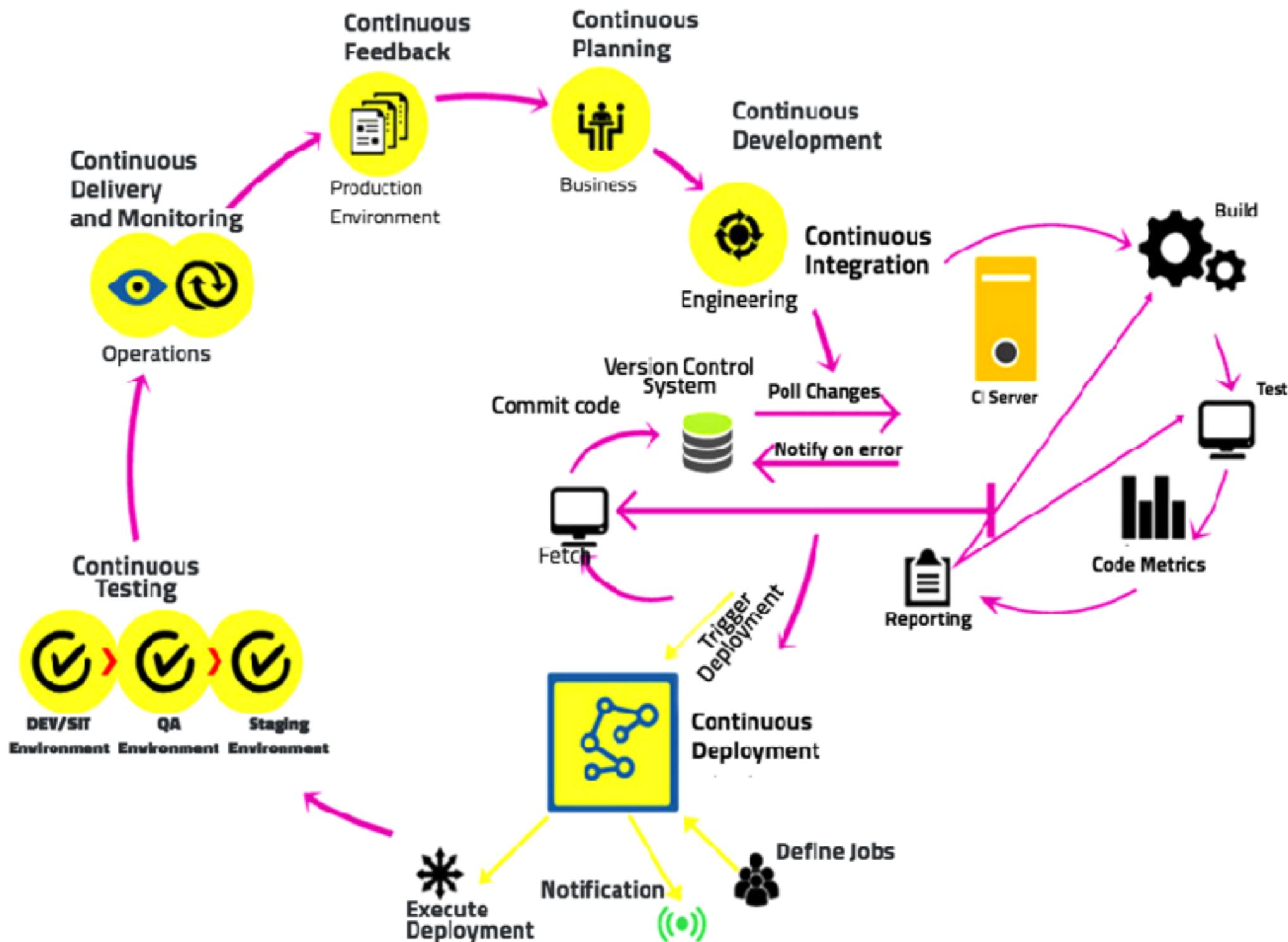
Sharing => Collaboration/Feedback



DevOps Practices



DevOps Practices



DevOps

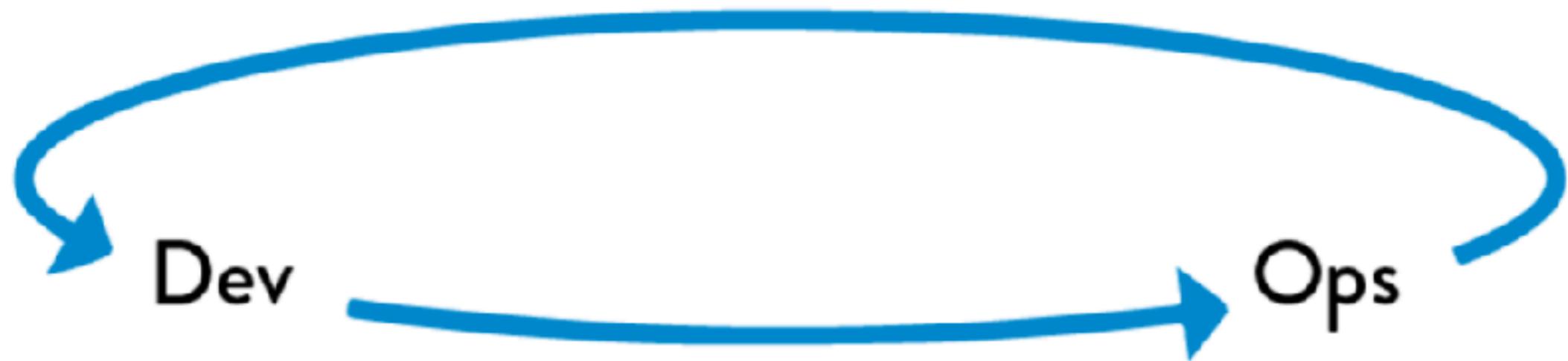
3 ways principle



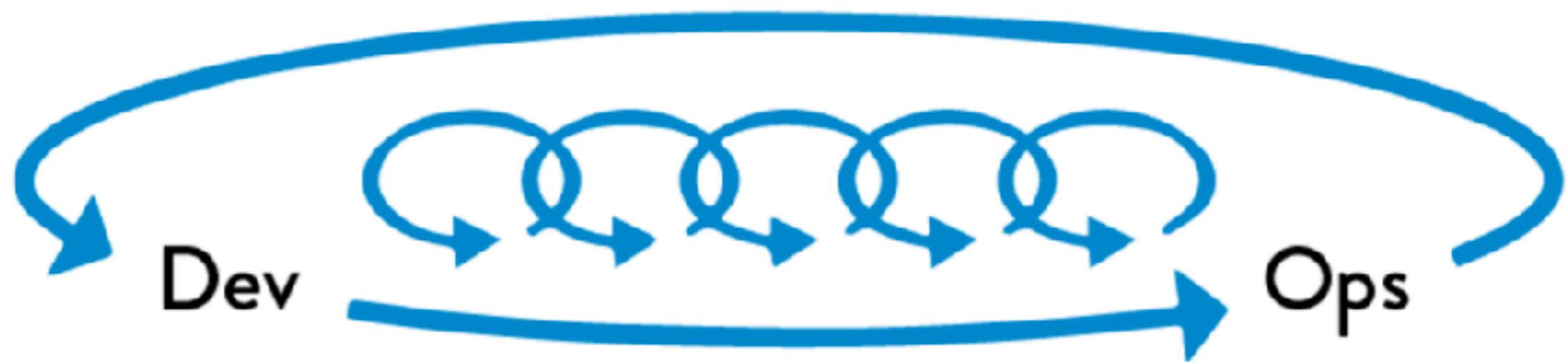
Flow principle



Feedback principle

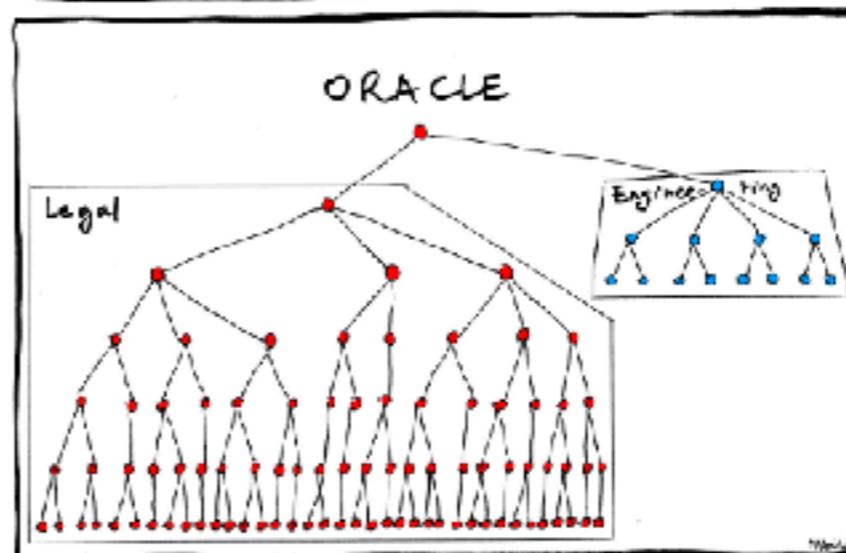
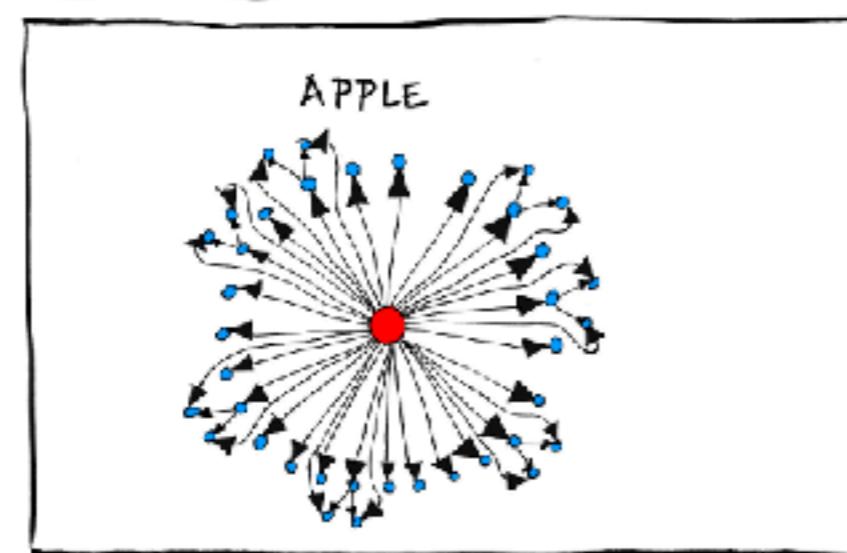
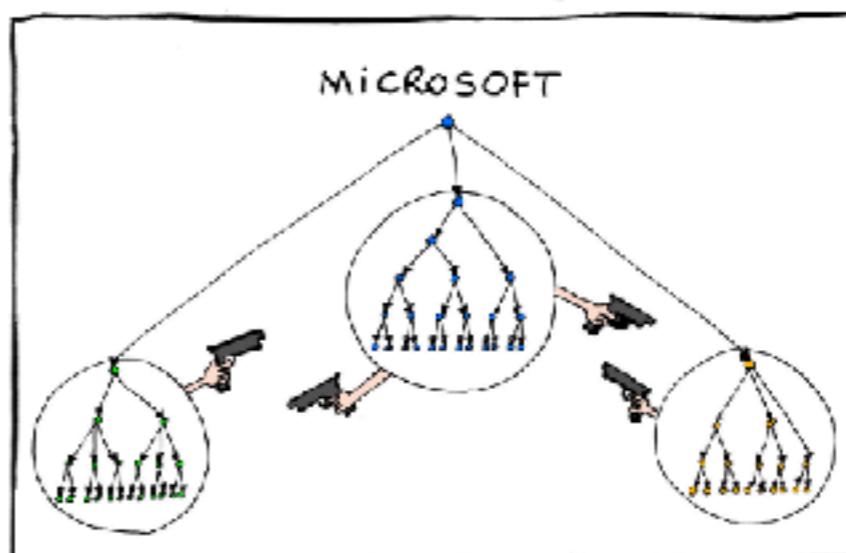
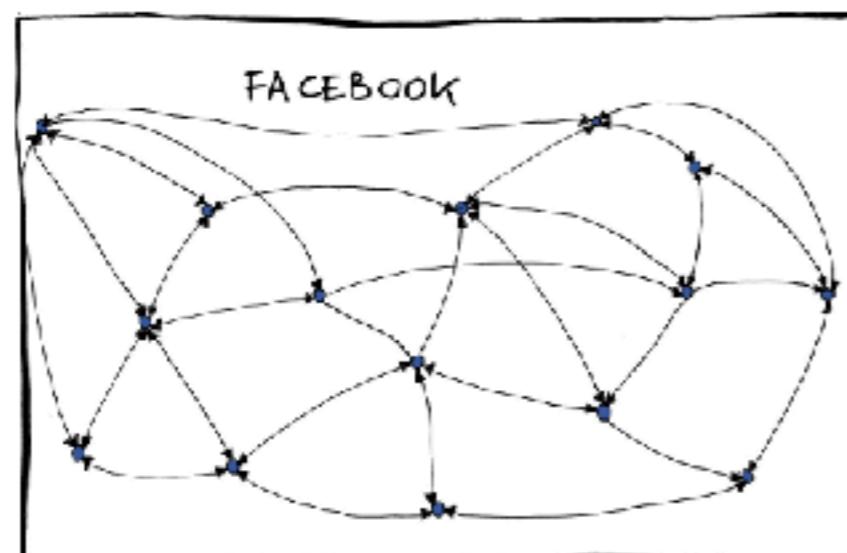
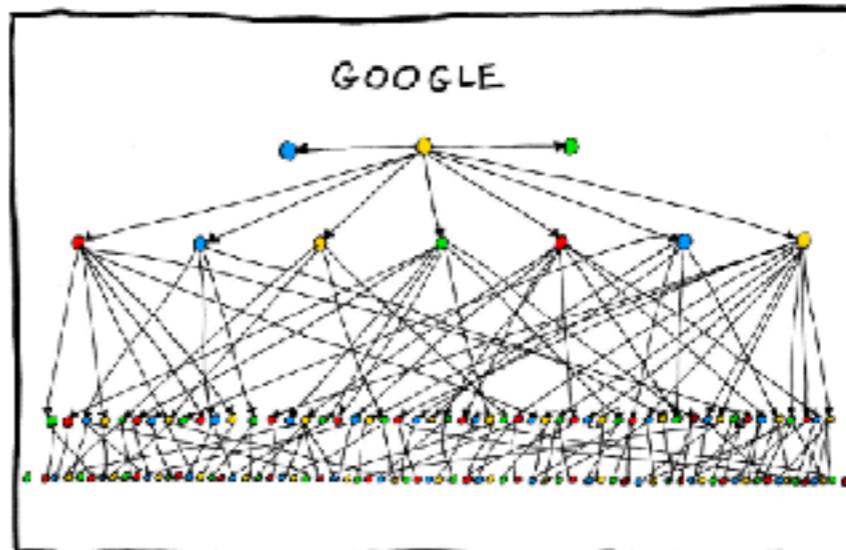
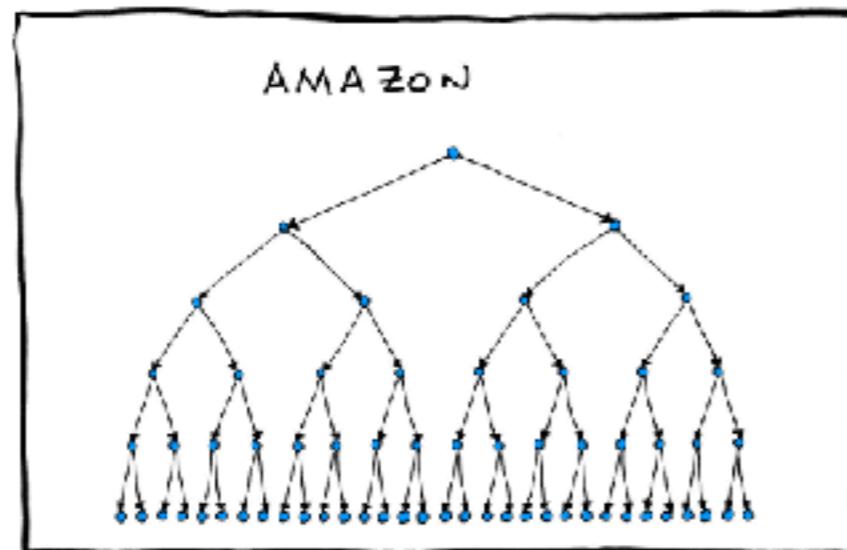


Continuous learning principle



All about Organization structure and culture





People -> Process -> Tool



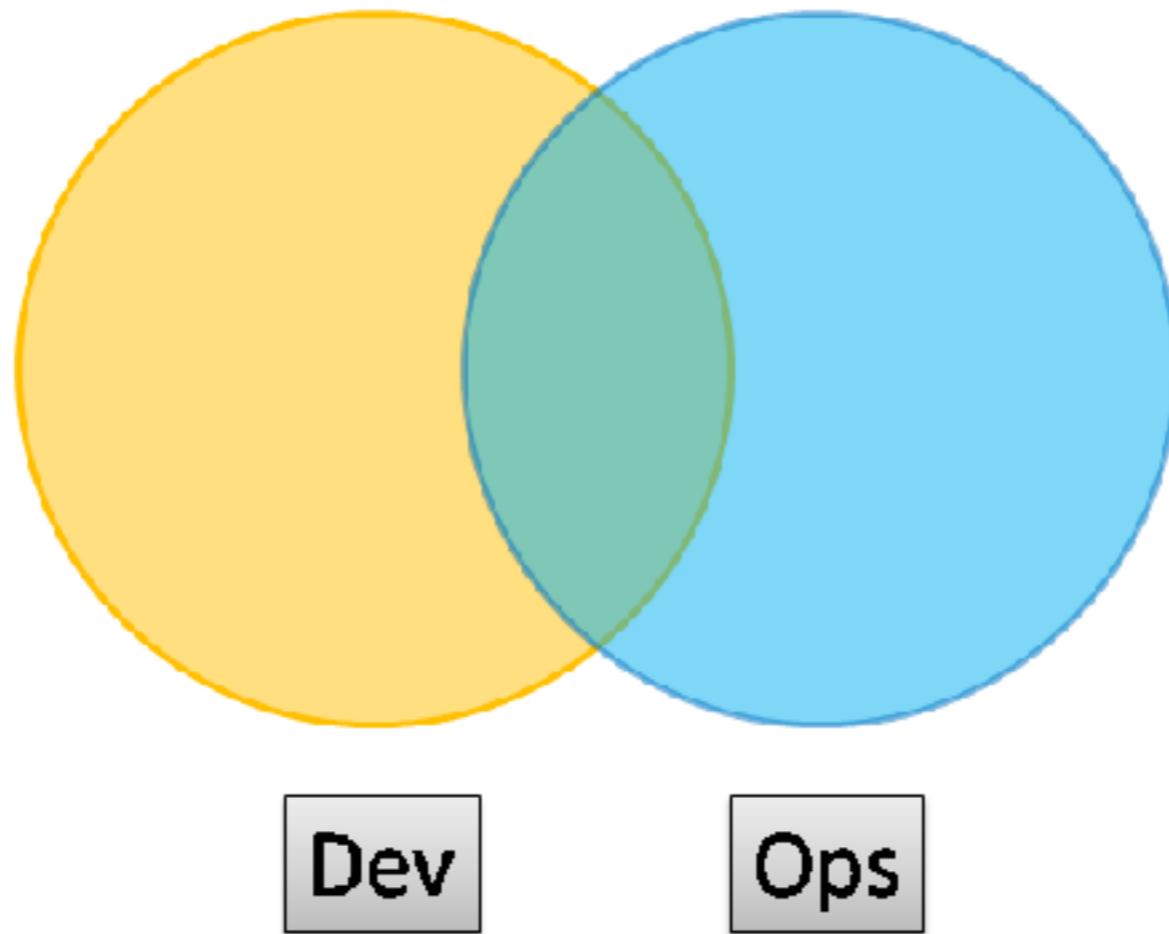
Autonomous



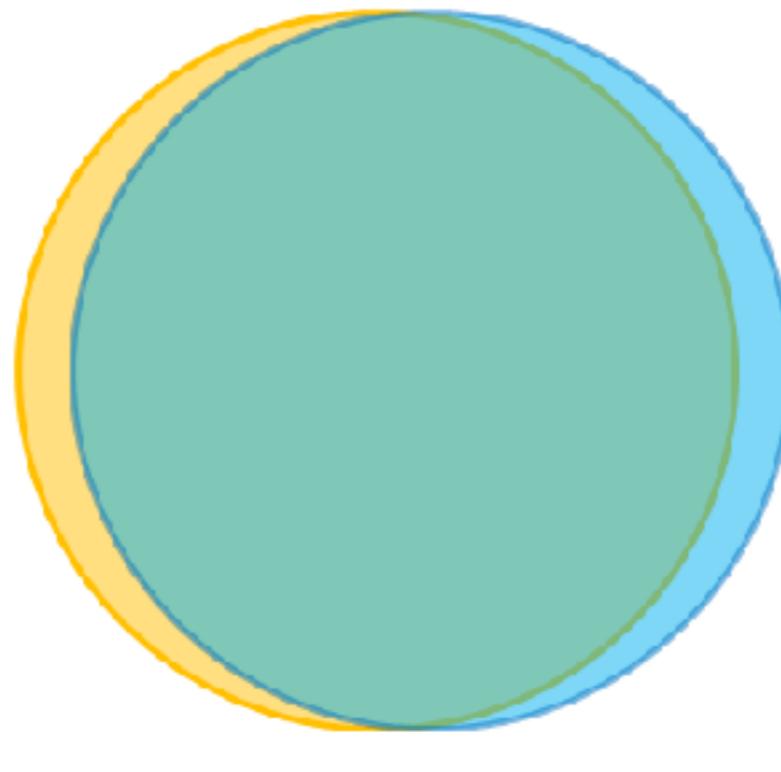
DevOps Topologies



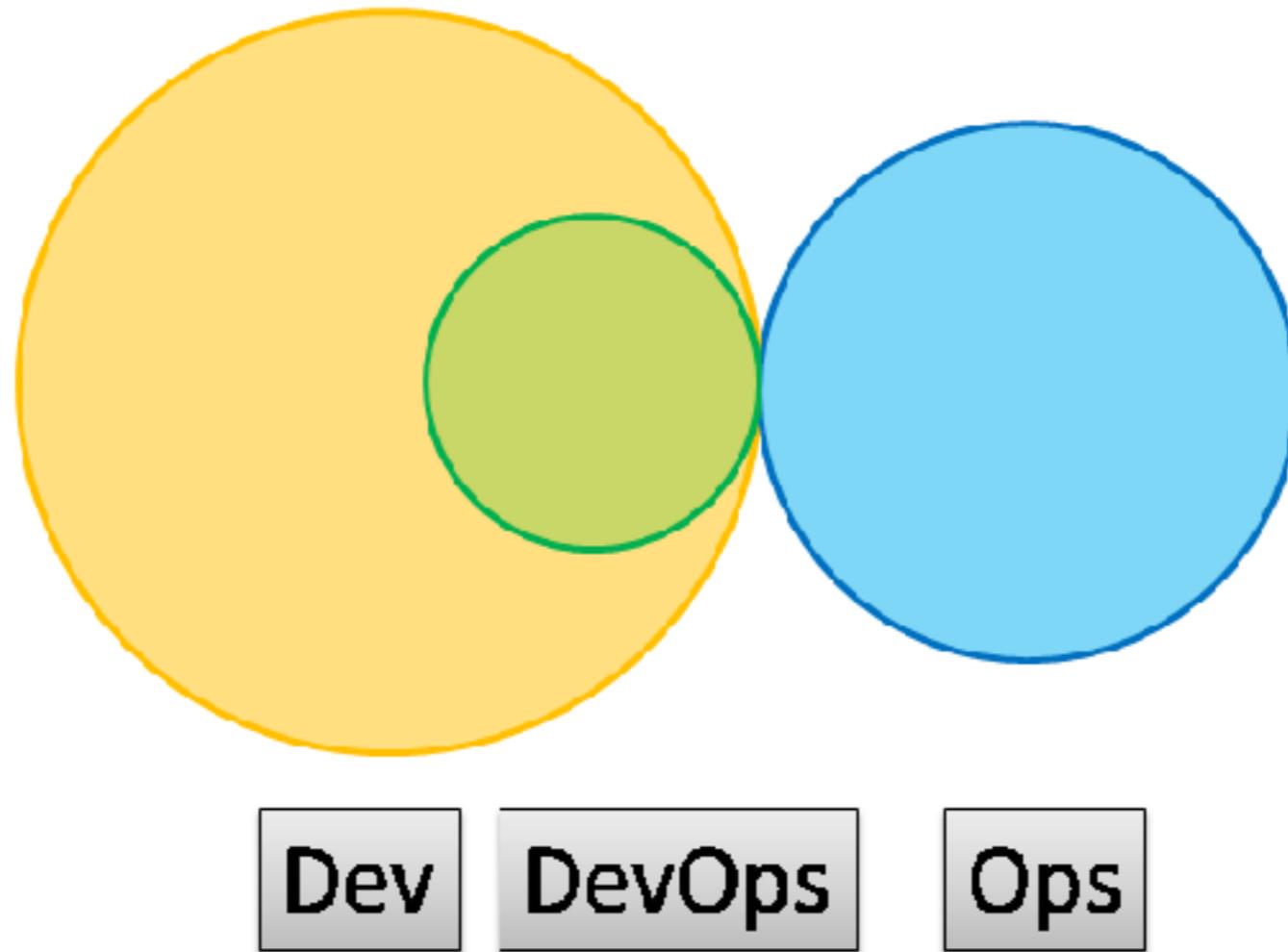
Type 1 – Smooth Collaboration



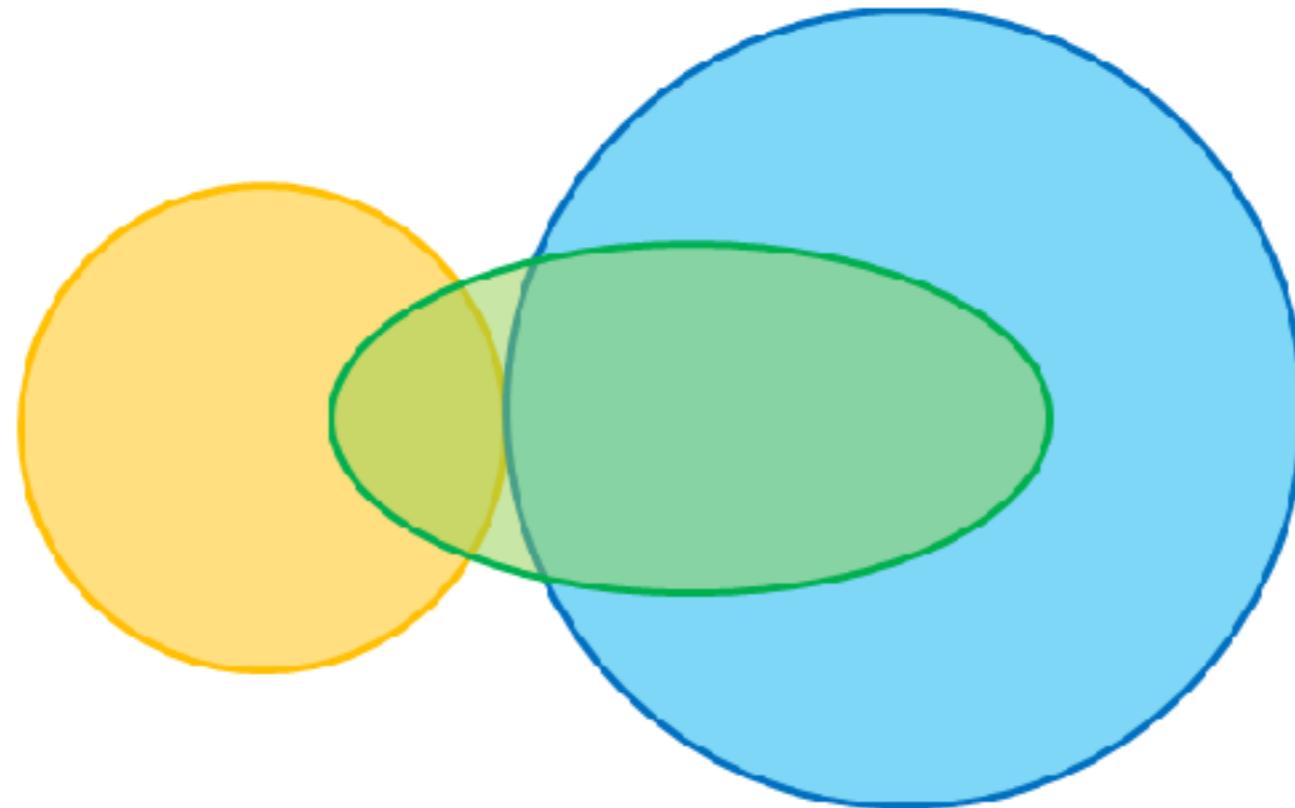
Type 2 – Fully Embedded



Type 3 – Infrastructure-as-a-Service



Type 4 – DevOps-as-a-Service



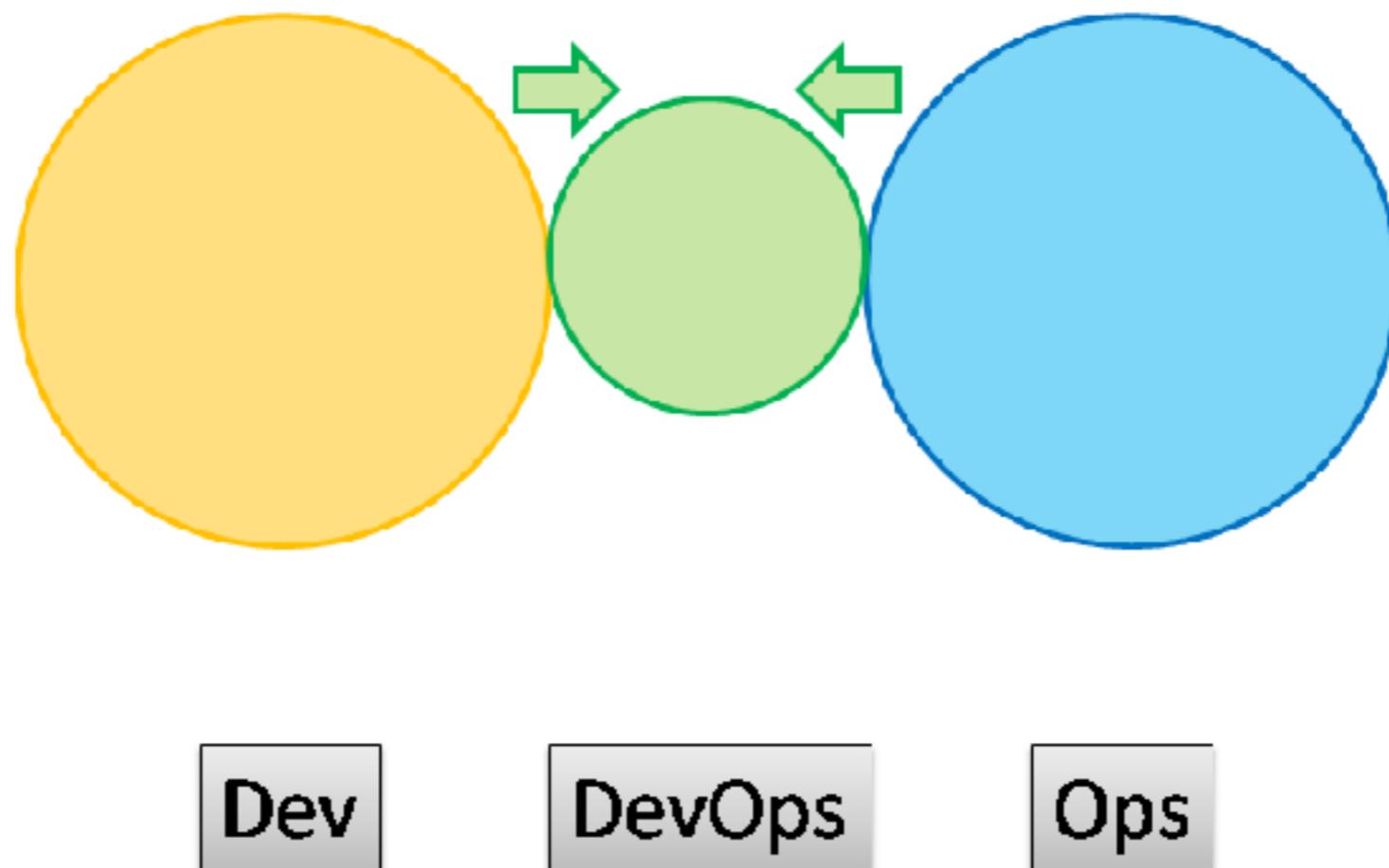
Dev

DevOps

Ops



Type 5 – Temporary DevOps Team



DevOps Tools

PERIODIC TABLE OF DEVOPS TOOLS (V2)

EMBED DOWNLOAD ADD

The Periodic Table of DevOps Tools is a grid-based visualization of various software tools used in the DevOps ecosystem. The table is organized into four main columns based on tool type:

- OpenSource**: Tools 1 through 40.
- SCM**: Tools 41 through 50.
- Build**: Tools 51 through 60.
- Database Mgmt**: Tools 61 through 70.

Each cell contains the tool name, its primary function, and its license type (Os, Fr, Fm, Pd, En). The table also includes a legend for tool categories and a color-coded grid for each row.

Category	Tool	Function	License
OpenSource	Gh	Github	Os
OpenSource	Gt	Dm	Os
OpenSource	Bb	Lb	Os
OpenSource	Gl	Rg	Os
OpenSource	Sv	Dt	Os
OpenSource	Hg	Dp	Os
OpenSource	Cw	Id	Os
SCM	Mv	Maven	Os
SCM	Gr	Gradle	Os
SCM	At	ANT	Os
SCM	Fn	FitNesse	Os
SCM	Se	Selenium	Fr
SCM	Ga	Gatling	Os
SCM	Dh	Docker Hub	Fr
SCM	Jn	Jenkins	Os
SCM	Ba	Bamboo	Pd
SCM	Tr	Travis CI	Os
SCM	Gd	Deployment Manager	Pd
SCM	Sf	Smartfrog	Os
SCM	Cn	Consul	Os
SCM	Bc	Botomi	Os
SCM	Mo	Nanos	Os
Build	Rg	Redgate	En
Build	Gp	Gulp	Os
Build	Br	Broccoli	Os
Build	Cu	Cucumber	Fr
Build	Cj	Cucumber.js	Cs
Build	Qu	Qunit	Fr
Build	Npm	npm	Os
Build	Cs	CodeShip	Fr
Build	Vs	Visual Studio	Pd
Build	Cr	CircleCI	Fr
Build	Cp	Capistrano	Fr
Build	Ju	Julia	Fr
Build	Rd	Rundeck	Os
Build	Cf	CFEngine	Fr
Build	Ds	Swarm	Fr
Database Mgmt	Gt	Git	Os
Database Mgmt	Dm	Drone	En
Database Mgmt	Bb	Bitbucket	Fm
Database Mgmt	Lb	Liquibase	Os
Database Mgmt	Fn	FitNesse	Os
Database Mgmt	Se	Selenium	Fr
Database Mgmt	Ga	Gatling	Os
Database Mgmt	Dh	Docker Hub	Fr
Database Mgmt	Jn	Jenkins	Os
Database Mgmt	Ba	Bamboo	Pd
Database Mgmt	Tr	Travis CI	Os
Database Mgmt	Gd	Deployment Manager	Pd
Database Mgmt	Sf	Smartfrog	Os
Database Mgmt	Cn	Consul	Os
Database Mgmt	Bc	Botomi	Os
Database Mgmt	Mo	Nanos	Os
Database Mgmt	Rs	Rackspace	En
Database Mgmt	Gt	GitLab	Os
Database Mgmt	Dm	Redgate	En
Database Mgmt	Bb	Grunt	Os
Database Mgmt	Lb	Gradle	Os
Database Mgmt	Fn	ANT	Os
Database Mgmt	Se	FitNesse	Os
Database Mgmt	Ga	Selenium	Fr
Database Mgmt	Dh	Docker Hub	Fr
Database Mgmt	Jn	Jenkins	Os
Database Mgmt	Ba	Bamboo	Pd
Database Mgmt	Tr	Travis CI	Os
Database Mgmt	Gd	Deployment Manager	Pd
Database Mgmt	Sf	Smartfrog	Os
Database Mgmt	Cn	Consul	Os
Database Mgmt	Bc	Botomi	Os
Database Mgmt	Mo	Nanos	Os
Database Mgmt	Rs	Rackspace	En
Config / Provisioning	Gt	Git	Os
Config / Provisioning	Dm	Drone	En
Config / Provisioning	Bb	Bitbucket	Fm
Config / Provisioning	Lb	Liquibase	Os
Config / Provisioning	Fn	FitNesse	Os
Config / Provisioning	Se	Selenium	Fr
Config / Provisioning	Ga	Gatling	Os
Config / Provisioning	Dh	Docker Hub	Fr
Config / Provisioning	Jn	Jenkins	Os
Config / Provisioning	Ba	Bamboo	Pd
Config / Provisioning	Tr	Travis CI	Os
Config / Provisioning	Gd	Deployment Manager	Pd
Config / Provisioning	Sf	Smartfrog	Os
Config / Provisioning	Cn	Consul	Os
Config / Provisioning	Bc	Botomi	Os
Config / Provisioning	Mo	Nanos	Os
Config / Provisioning	Rs	Rackspace	En
Containerization	Gt	Git	Os
Containerization	Dm	Drone	En
Containerization	Bb	Bitbucket	Fm
Containerization	Lb	Liquibase	Os
Containerization	Fn	FitNesse	Os
Containerization	Se	Selenium	Fr
Containerization	Ga	Gatling	Os
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Containerization	Gd	Deployment Manager	Pd
Containerization	Sf	Smartfrog	Os
Containerization	Cn	Consul	Os
Containerization	Bc	Botomi	Os
Containerization	Mo	Nanos	Os
Containerization	Rs	Rackspace	En
Collaboration	Gt	Git	Os
Collaboration	Dm	Drone	En
Collaboration	Bb	Bitbucket	Fm
Collaboration	Lb	Liquibase	Os
Collaboration	Fn	FitNesse	Os
Collaboration	Se	Selenium	Fr
Collaboration	Ga	Gatling	Os
Collaboration	Dh	Docker Hub	Fr
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Collaboration	Gd	Deployment Manager	Pd
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Collaboration	Cn	Consul	Os
Collaboration	Bc	Botomi	Os
Collaboration	Mo	Nanos	Os
Collaboration	Rs	Rackspace	En
Security	Gt	Git	Os
Security	Dm	Drone	En
Security	Bb	Bitbucket	Fm
Security	Lb	Liquibase	Os
Security	Fn	FitNesse	Os
Security	Se	Selenium	Fr
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Security	Ba	Bamboo	Pd
Security	Tr	Travis CI	Os
Security	Gd	Deployment Manager	Pd
Security	Sf	Smartfrog	Os
Security	Cn	Consul	Os
Security	Bc	Botomi	Os
Security	Mo	Nanos	Os
Security	Rs	Rackspace	En

XebiaLabs
Deliver Faster

Follow @xebialabs

91	Fm	92	Fr	93	Fm	94	Fm	95	Fr	96	Fm	97	Fr	98	Pd	99	Fm	100	Pd	101	Fm	102	Fm	103	Fm	104	Pd	105	Fr
Xlr	Ur	Bm	Hp	Au	Pi	Sr	Tfs	Tr	Jr	Rf	Sl	Fd	Pv	Sn															
XL Release	UrbanCode Release	RMC Release Process	HP Cedar	Atomic	Plutora Release	Servera Release	Team Foundation	Telco	Jira	HipChat	Slack	Flowdock	Primal Tracker	ServiceNow															
Ki	Nr	Ni	Zb	Dd	EI	St	Sp	Le	Sl	Ls	Gr	Sn	Tr	Ff															
Kibana	New Relic	Nagios	Zabbix	DataDog	Elasticsearch	StackState	Splunk	Logentries	Sensu	Logstash	Graylog	Snort	Tripwire	Fortify															

<https://xebialabs.com/periodic-table-of-devops-tools/>



Microservices

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No DevOps Team

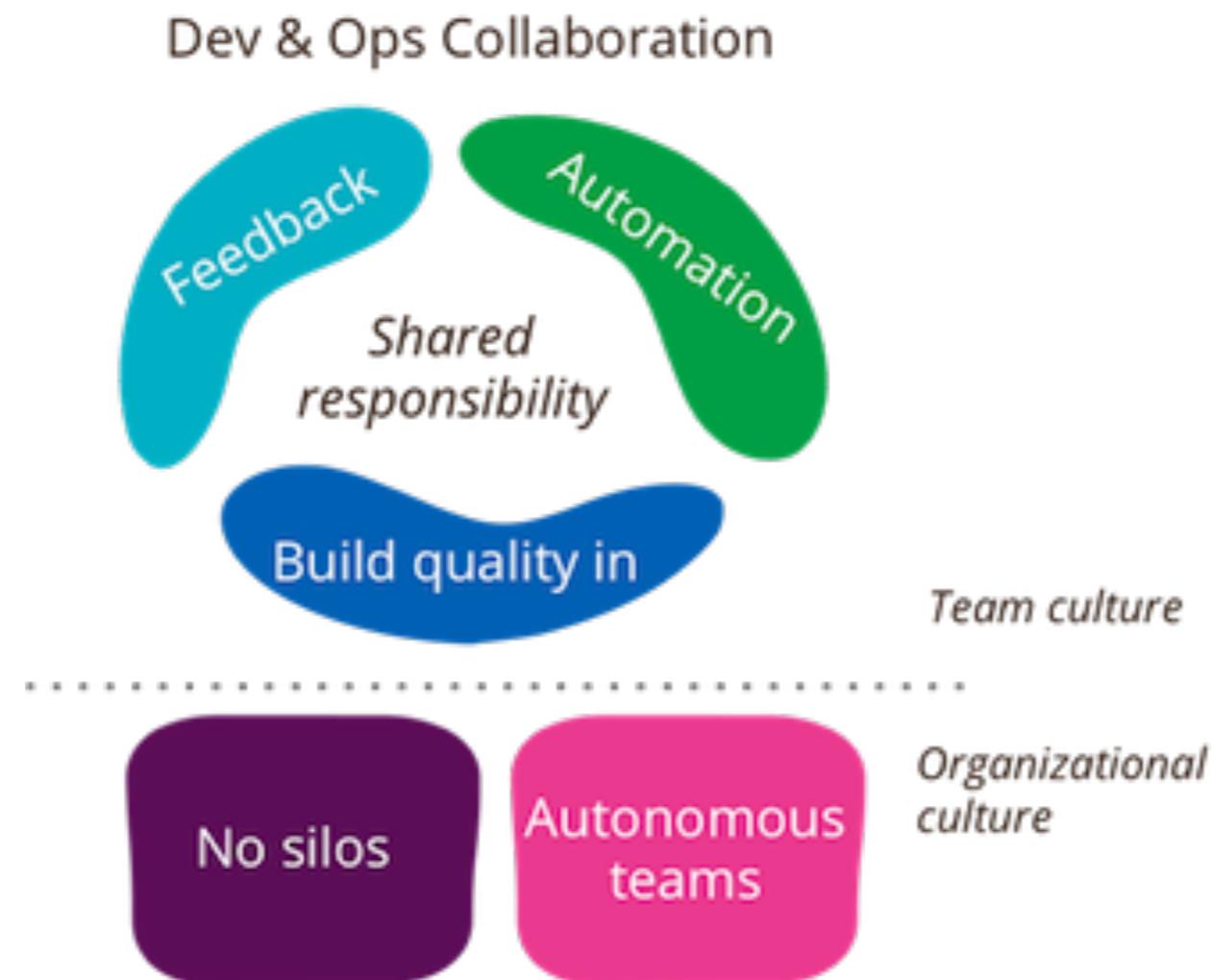
Problem department !!



DevOps != Tools
Tools enable DevOps



Team and Organization culture



<https://martinfowler.com/bliki/DevOpsCulture.html>

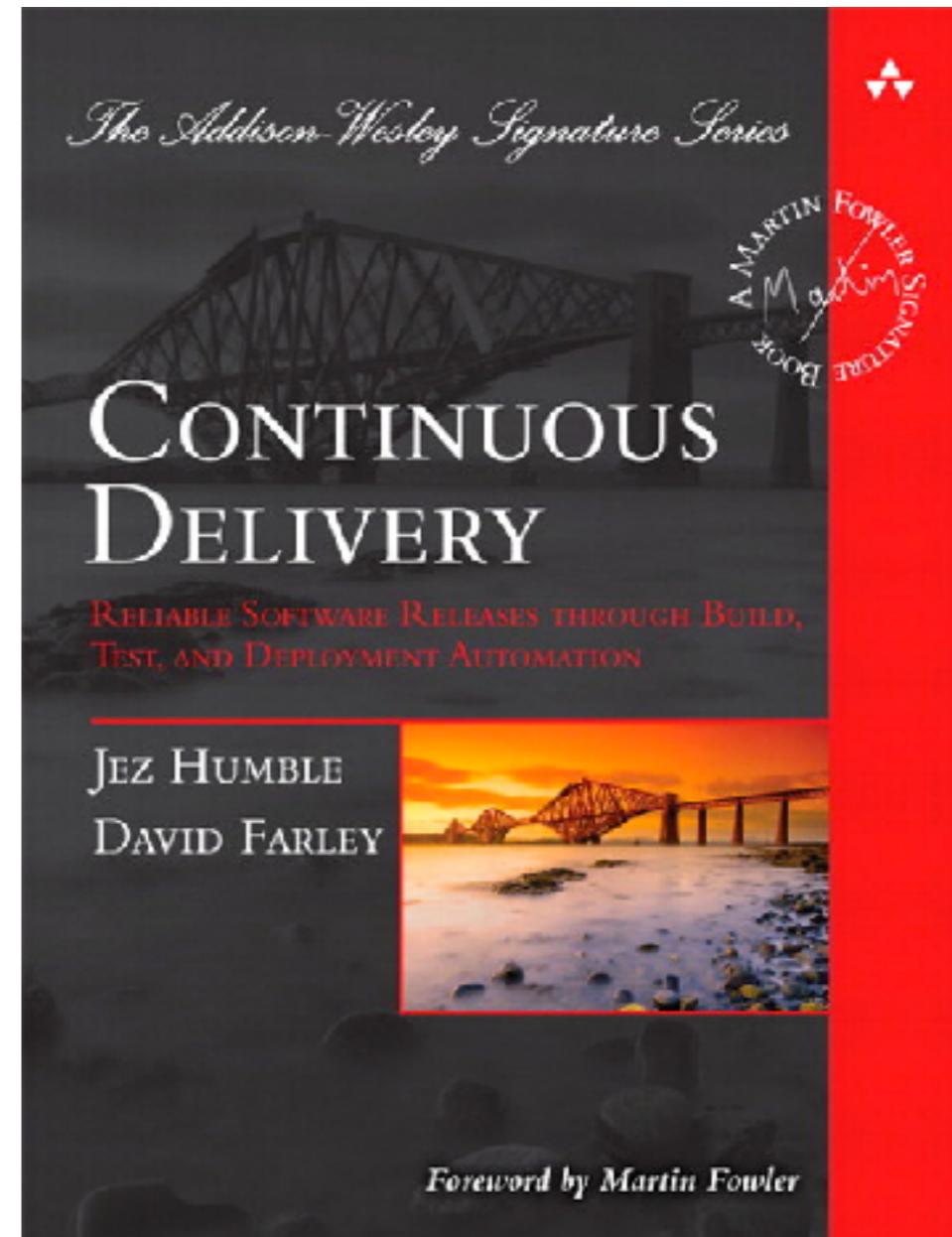
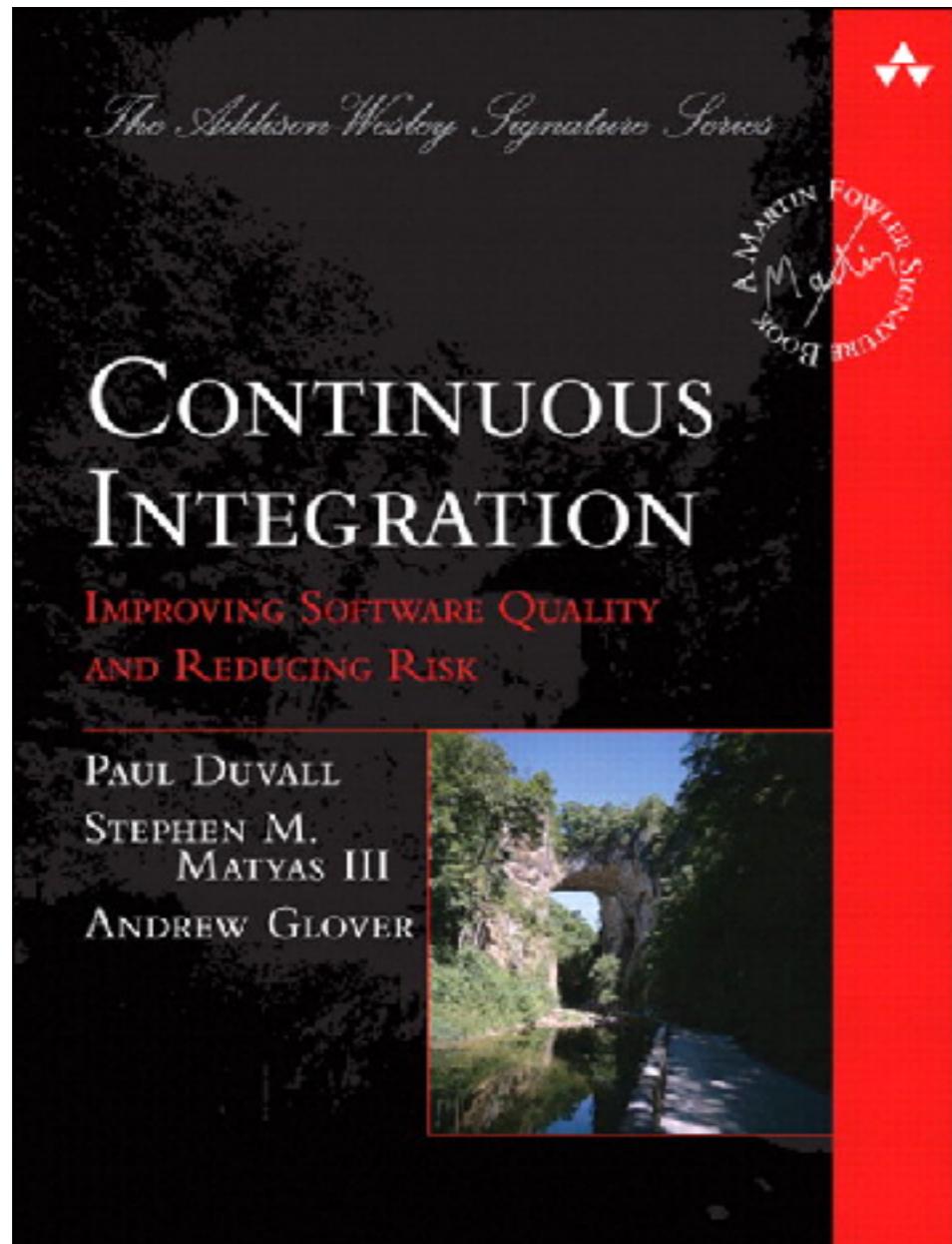




Start with Continuous Integration Continuous Delivery



Improve quality and reduce risk



Microservices

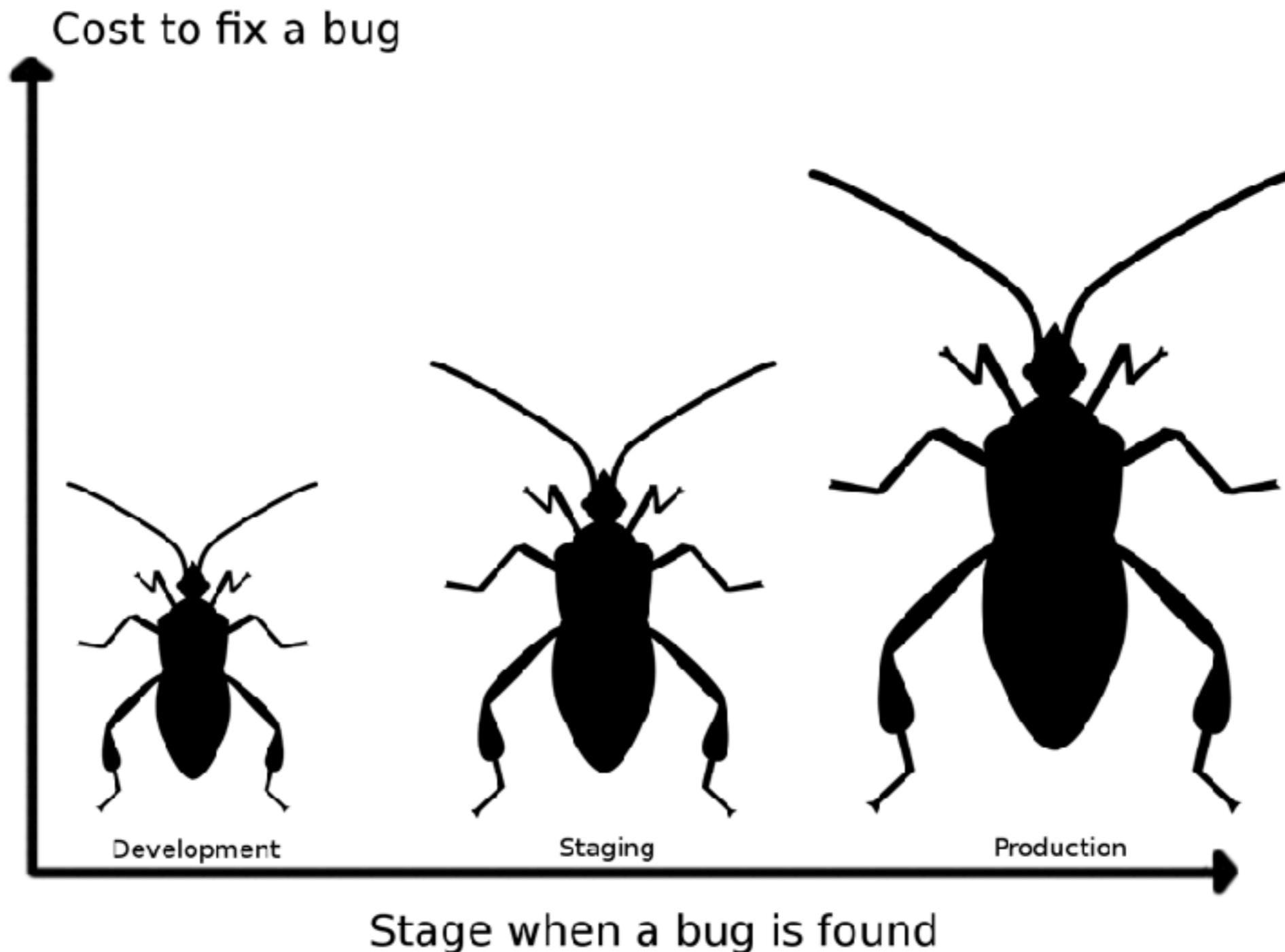
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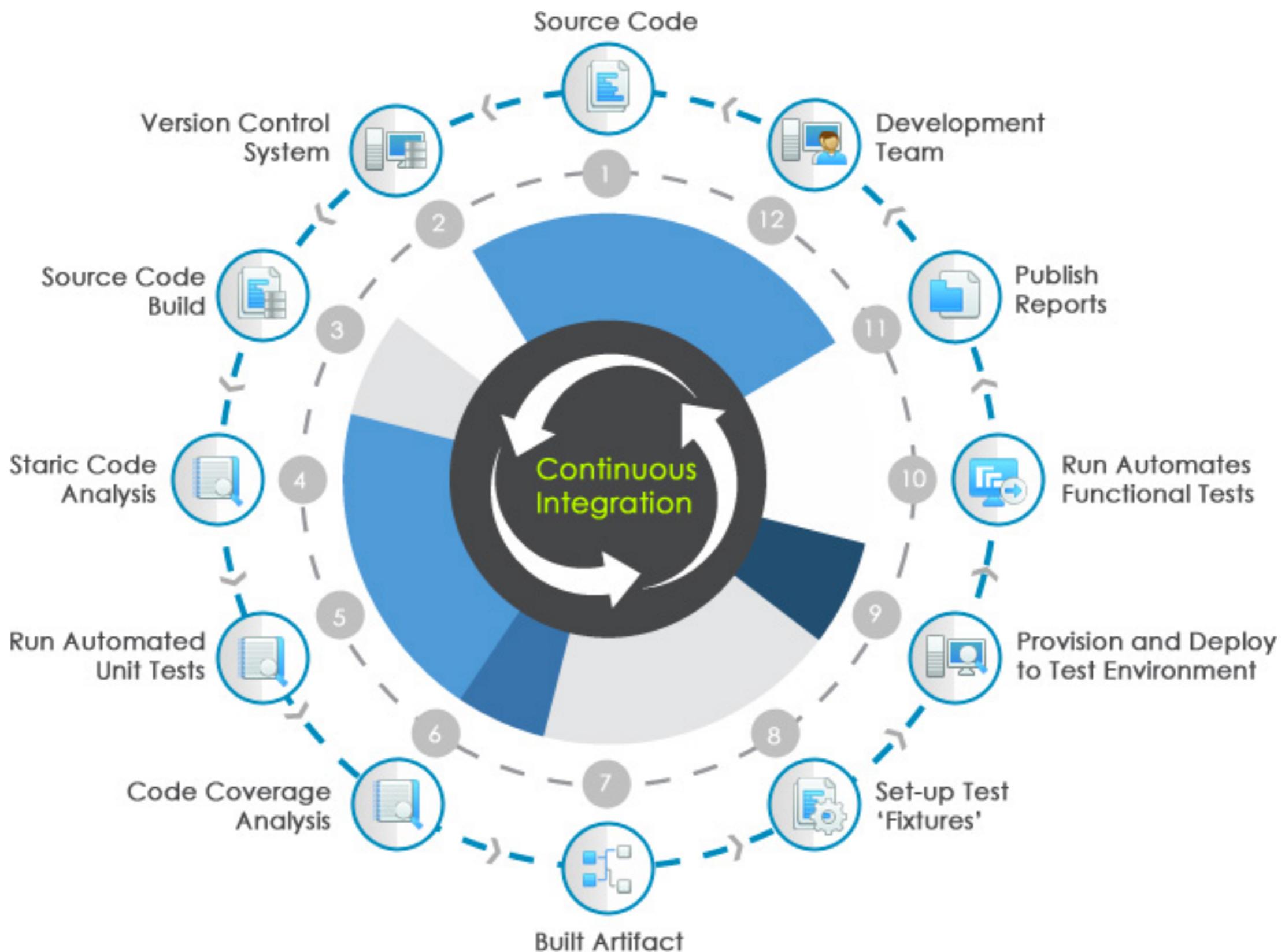
The cost of integration

1. Merging the code
2. Duplicate changes
3. Test again again !!
4. Fixing bugs
5. Impact on stability



The cost of integration







Jenkins

Bamboo



TeamCity

> goTM



Hudson

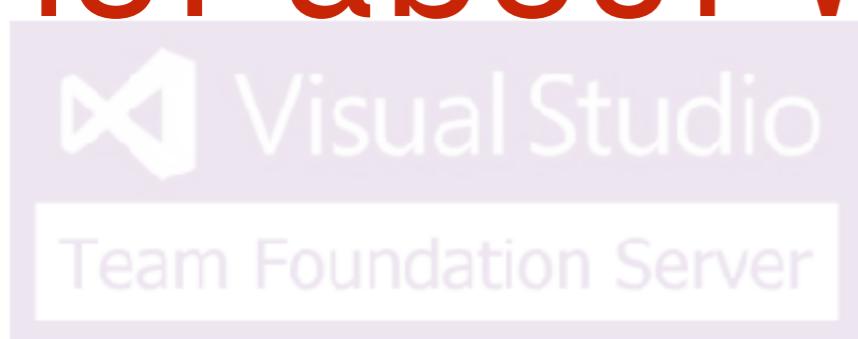




Jenkins

Bamboo

CI is about what people do
not about what tools they use



Hudson



Continuous Integration

Discipline to integrate frequently



Continuous Integration

Strive to make **small change**

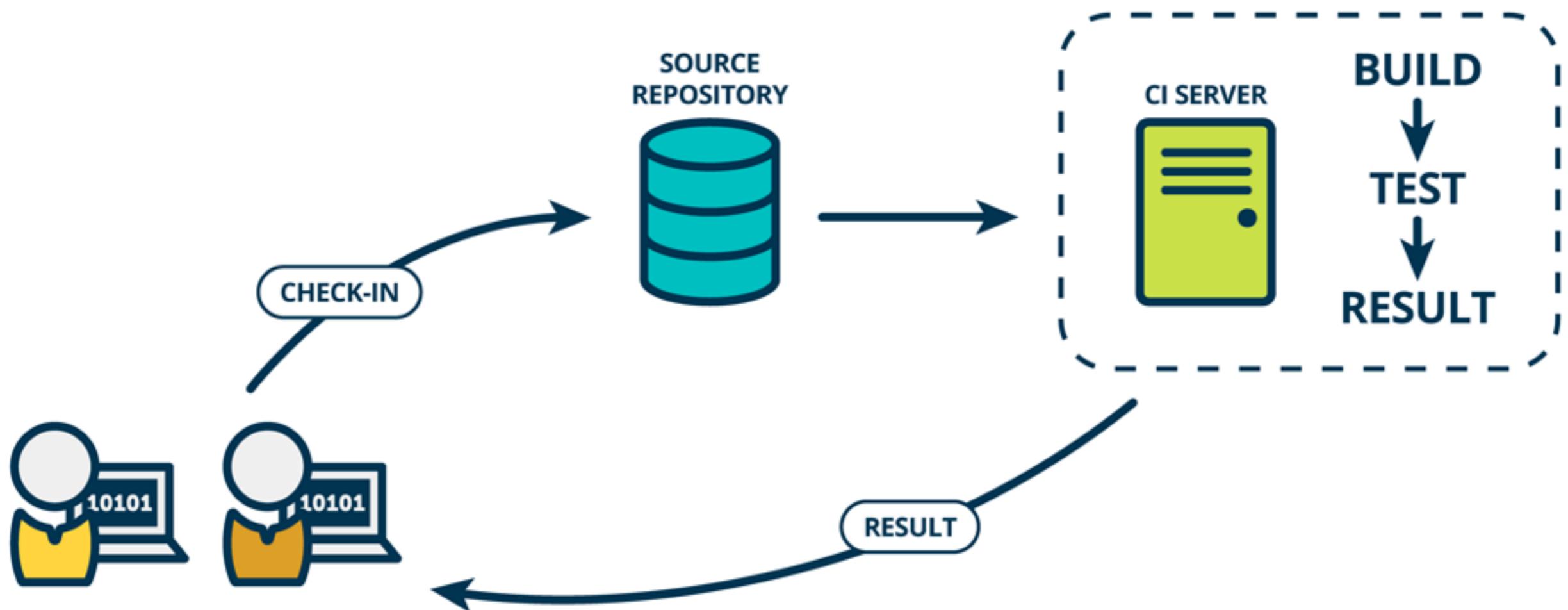


Continuous Integration

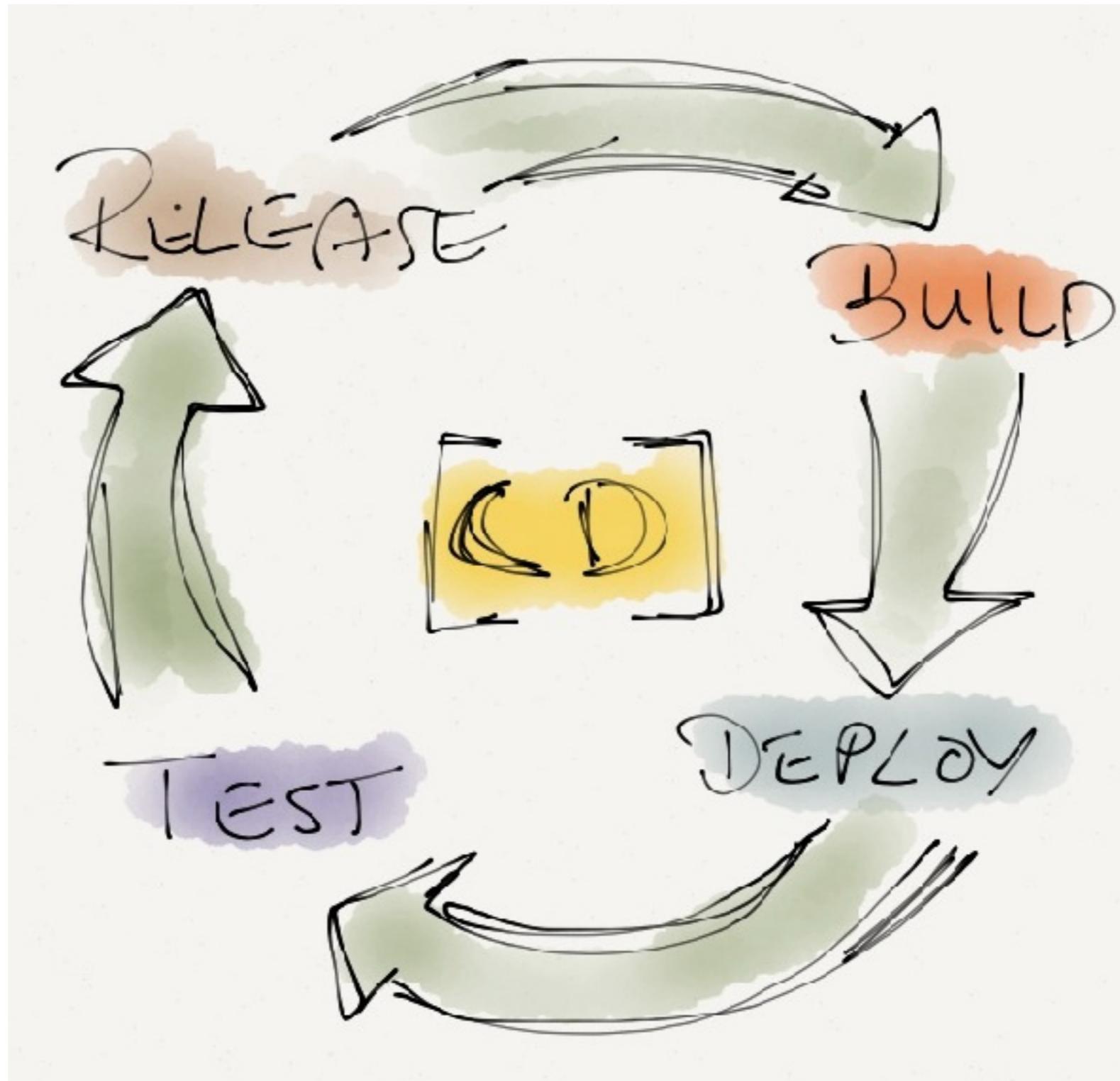
Strive for **fast feedback**



Continuous Integration



CD ?



CD ?

CONTINUOUS DELIVERY



CONTINUOUS DEPLOYMENT



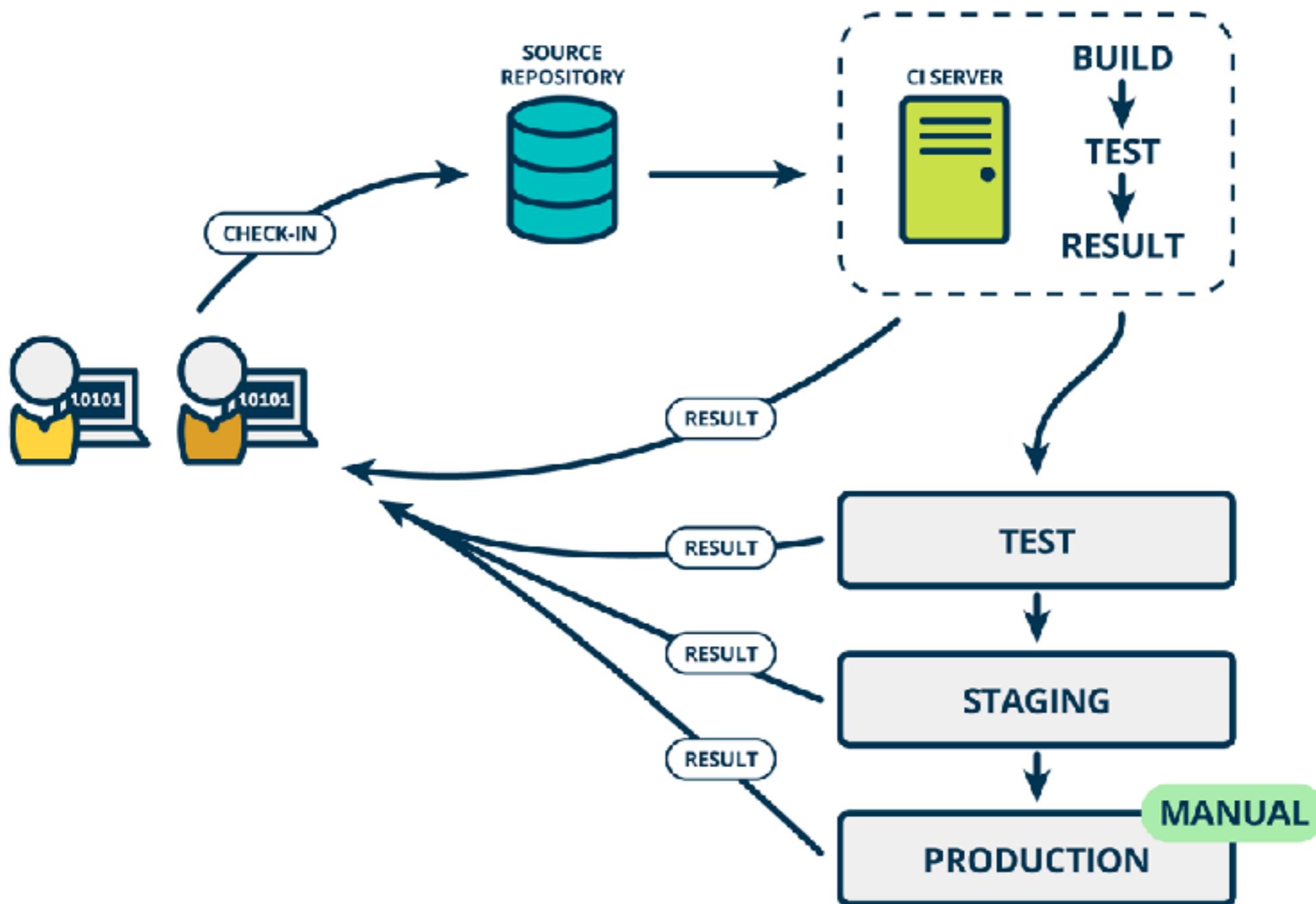
<http://blog.crisp.se/2013/02/05/yassalsundman/continuous-delivery-vs-continuous-deployment>



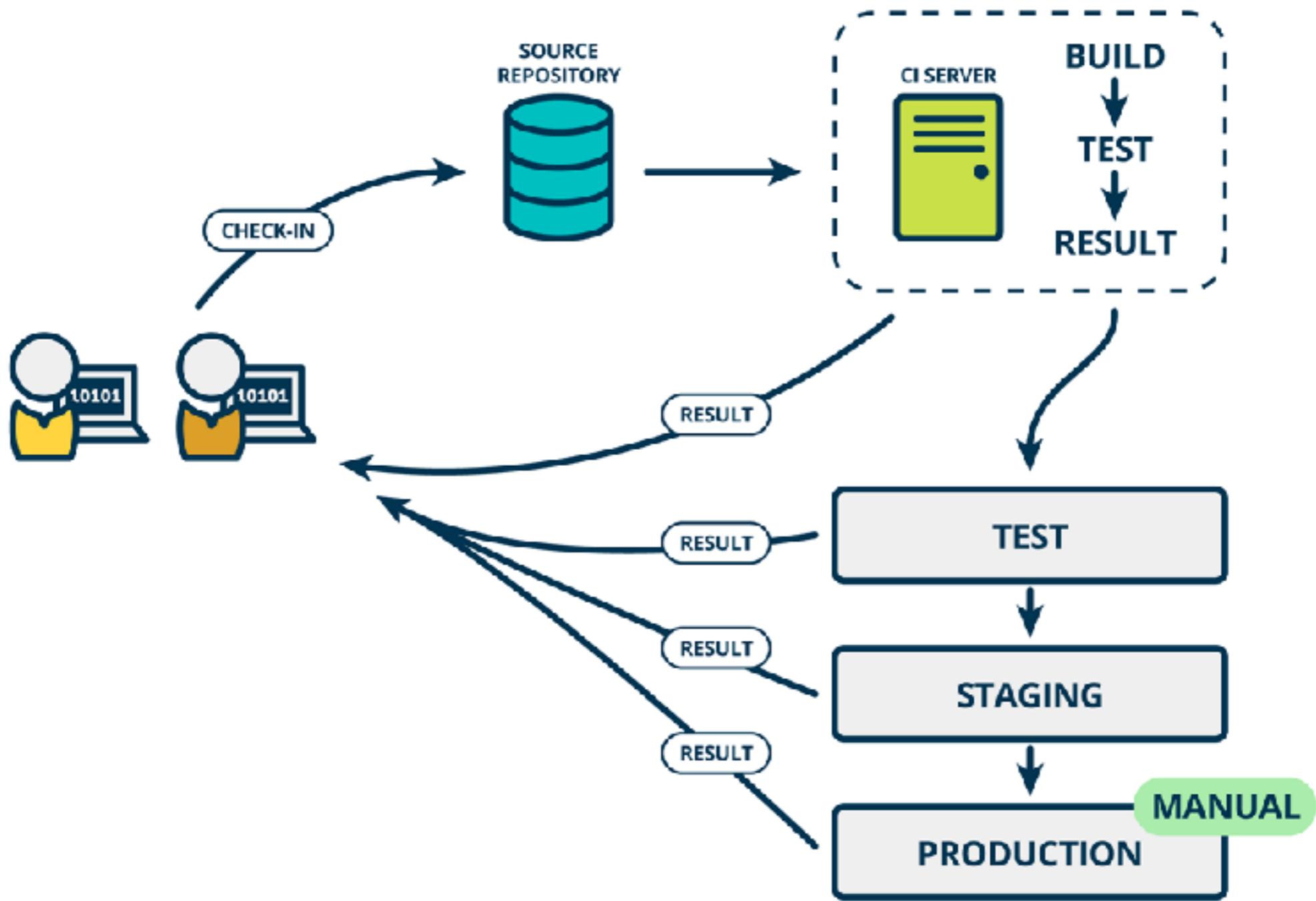
Microservices

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Continuous Delivery



Rise of DevOps



Continuous Integration

is a Software development practices



Practice 1

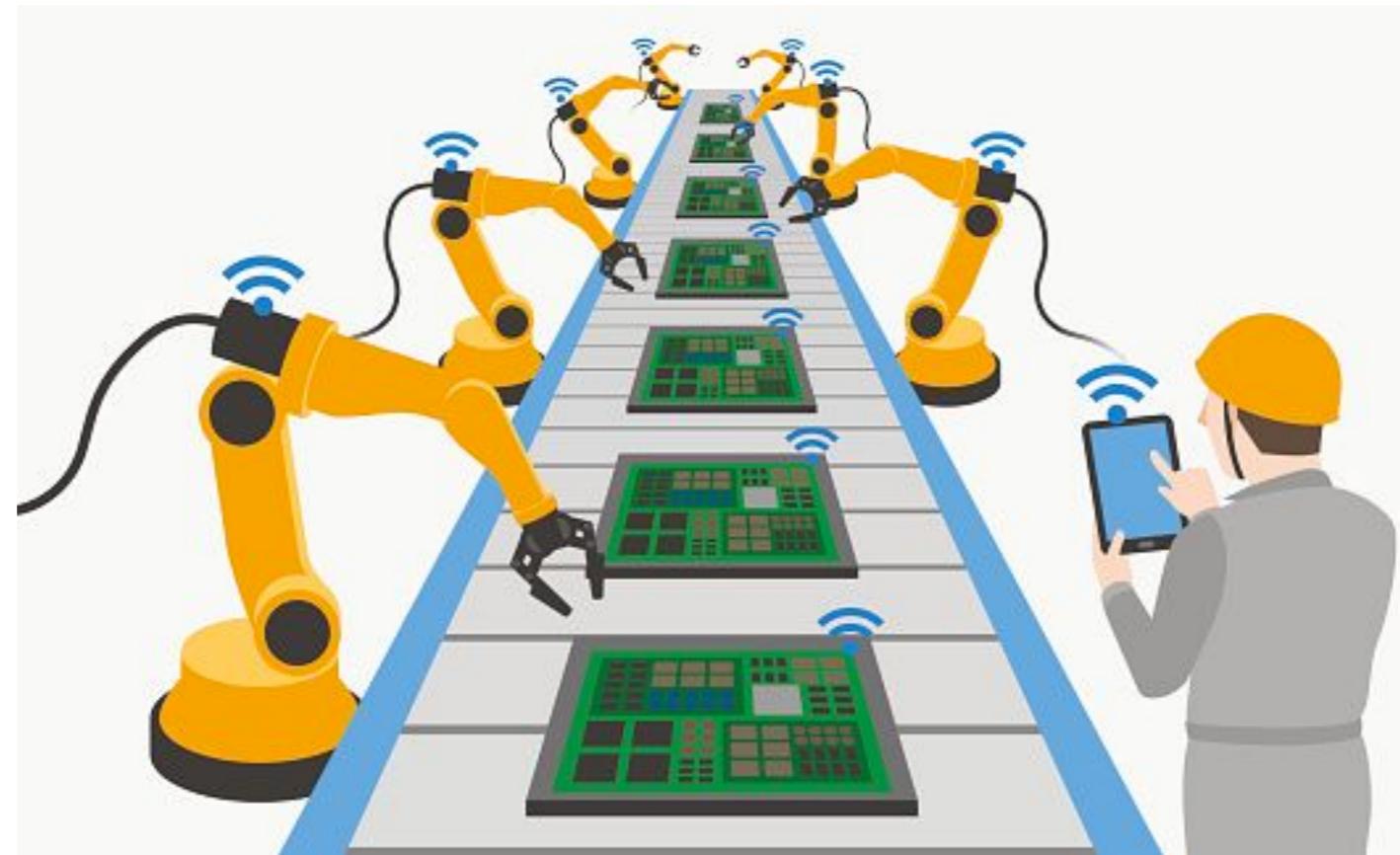
Maintain a single source repository

In general, you should store in source control
everything you need to build anything



Practice 2

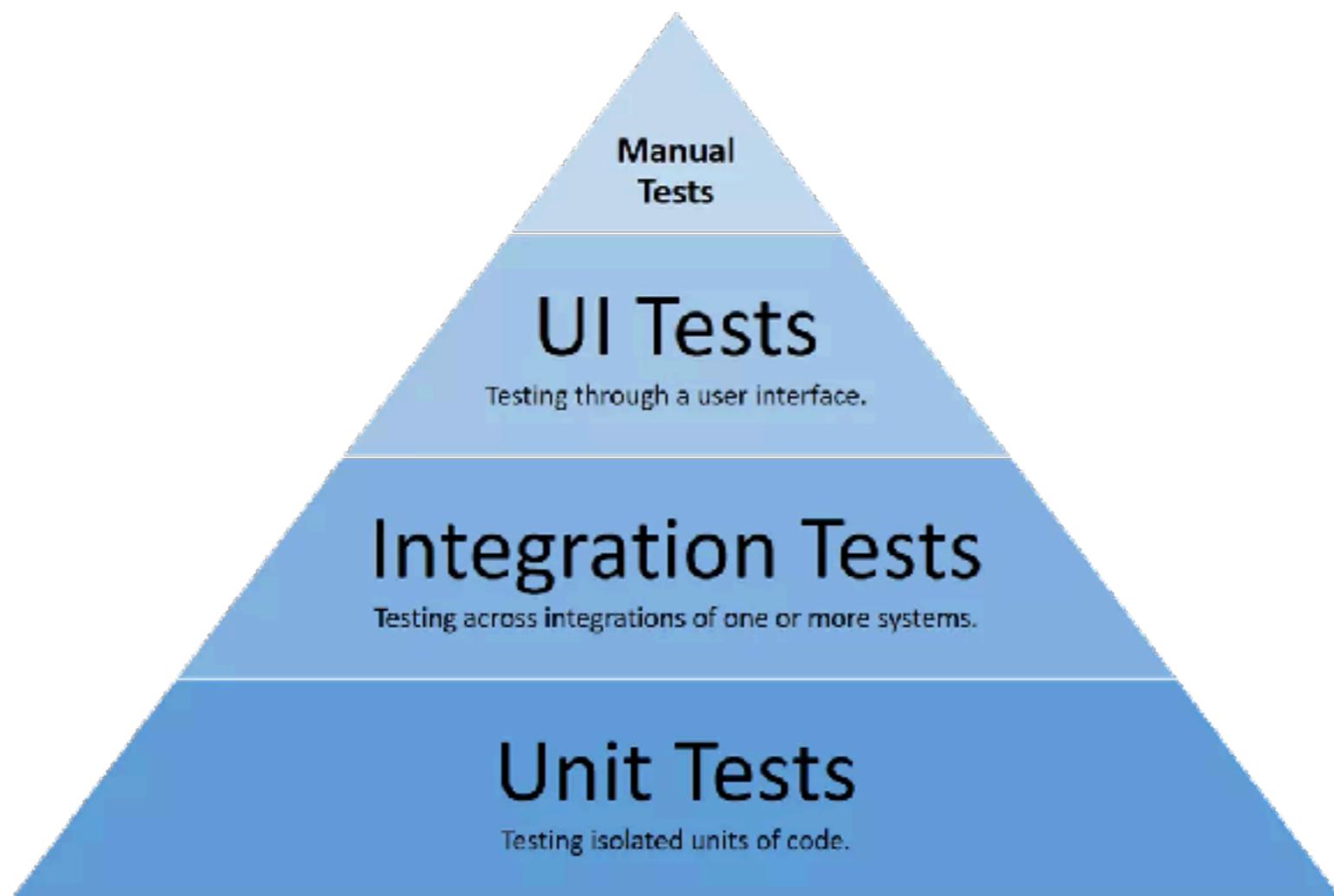
Automated the build
Automated environment for builds



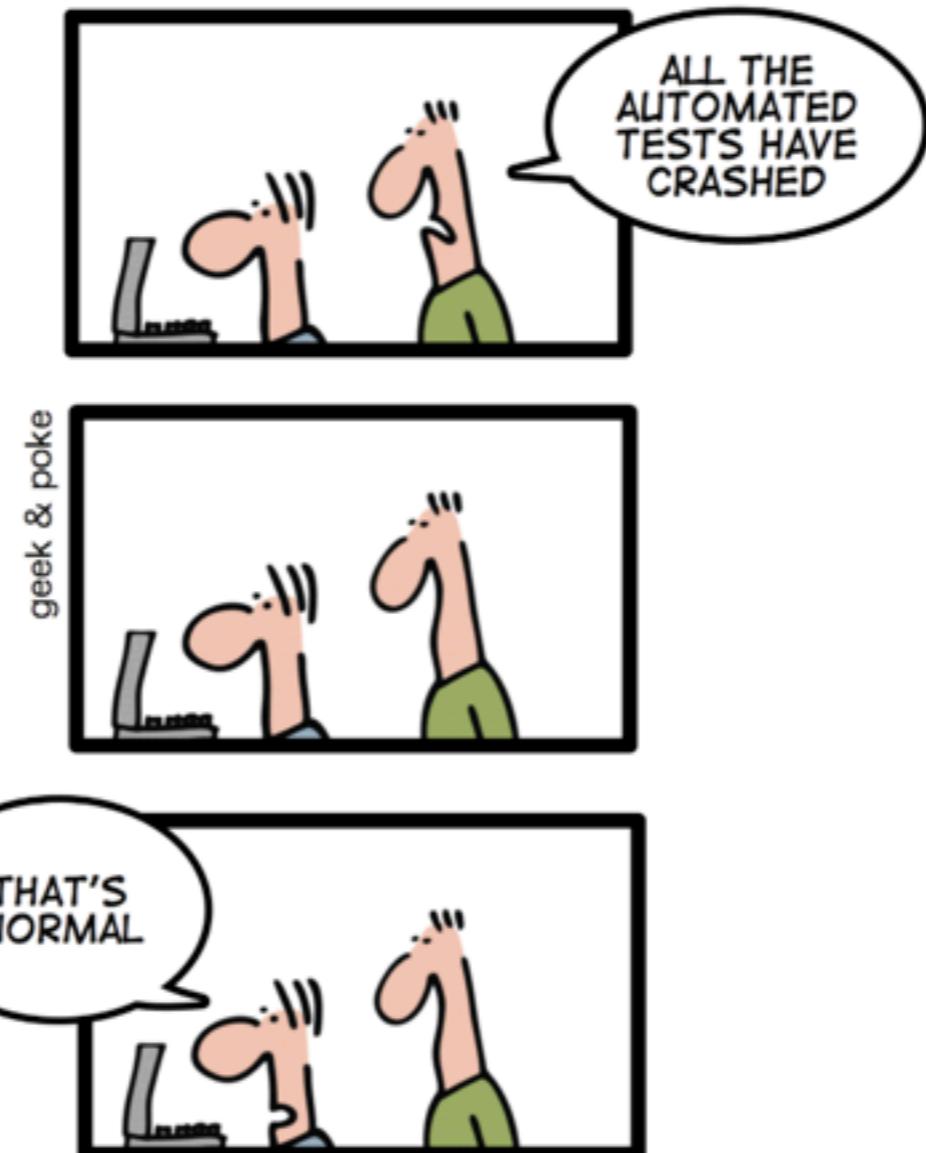
Practice 3

Make your build **self-testing**

Build process => compile, linking and **testing**



*TODAY: CONTINUOUS INTEGRATION
GIVES YOU THE COMFORTING
FEELING TO KNOW THAT
EVERYTHING IS NORMAL*

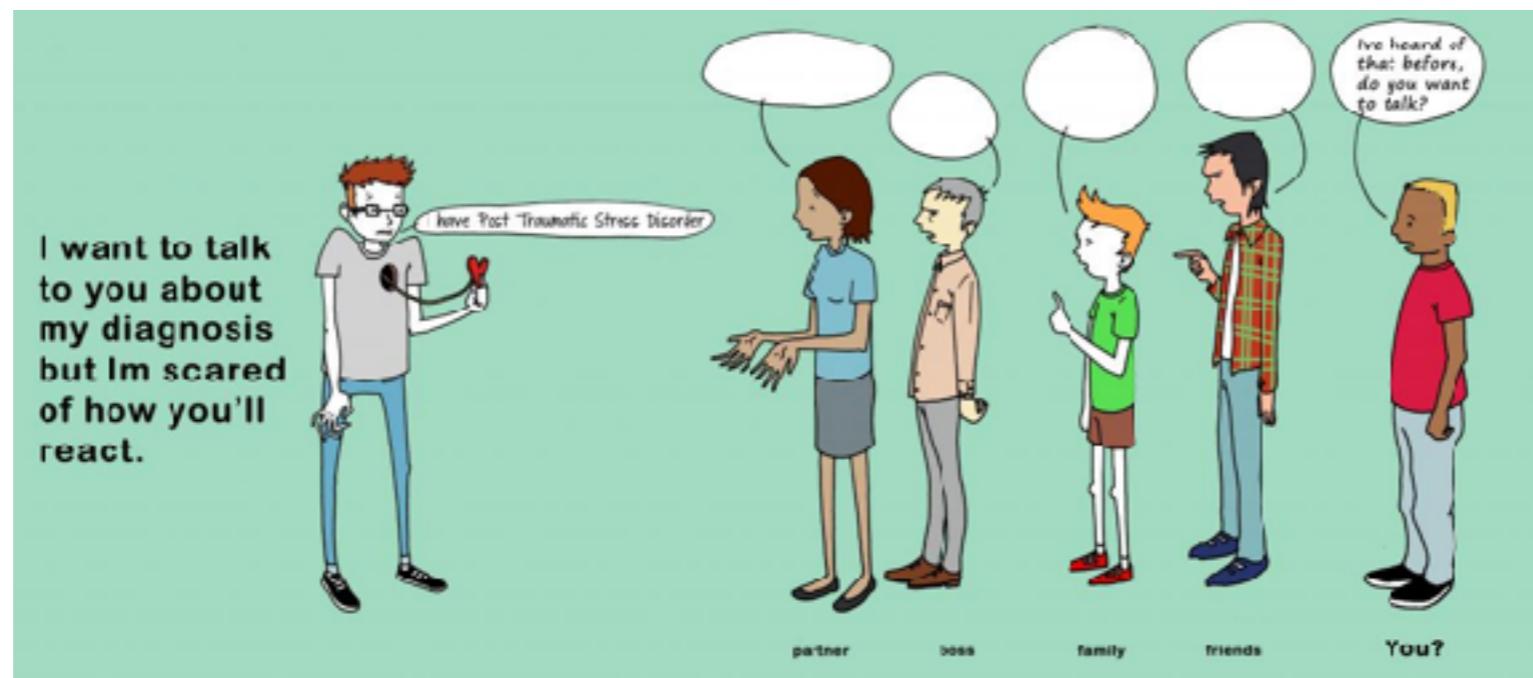


Practice 4

Everyone **commits** to the mainline everyday

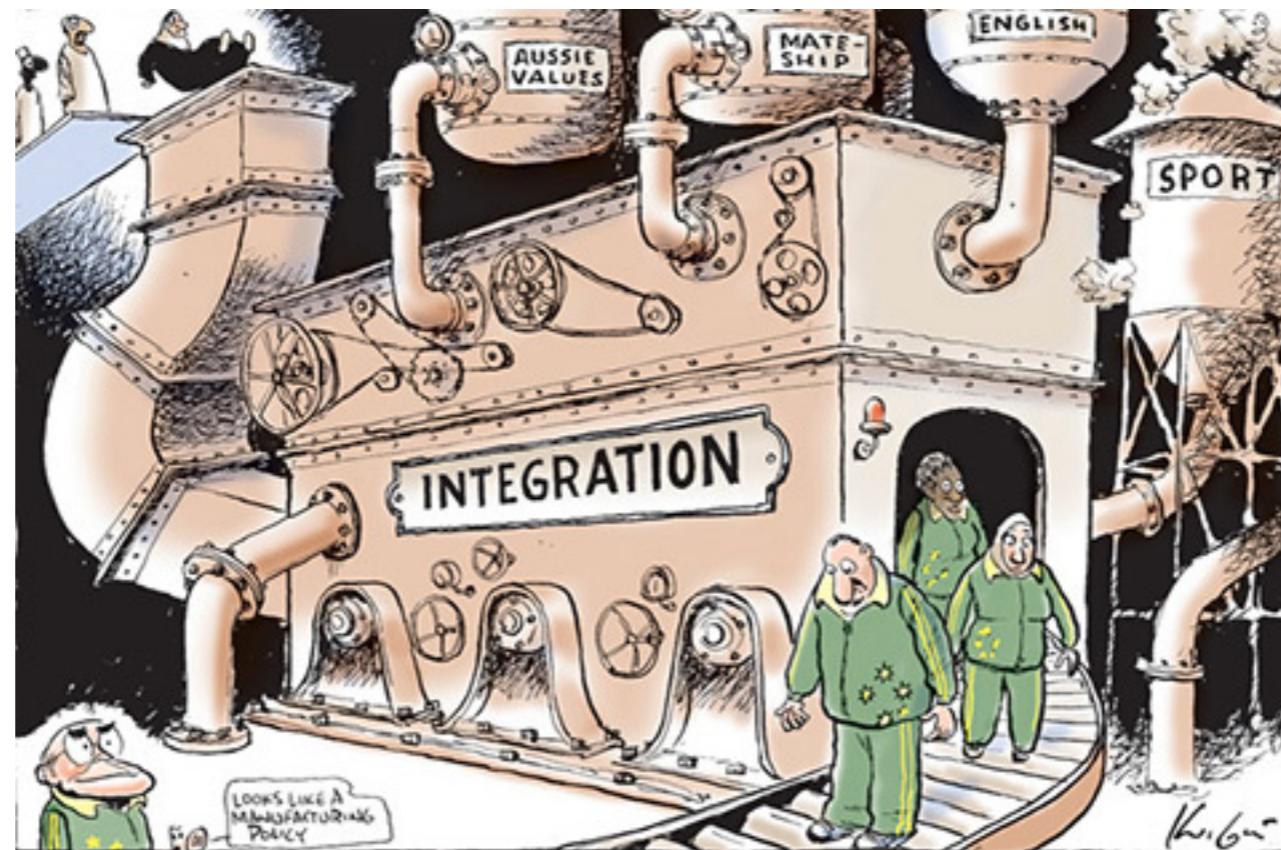
Integration is about **communication**

Integration allows developers to **tell** other developers



Practice 5

Every commits should build the mainline on an
Integration machine



Nightly build is not enough for Continuous Integration



Practice 6

Fix broken builds immediately

“Nobody has a higher priority task than fixing the build”



Practice 7

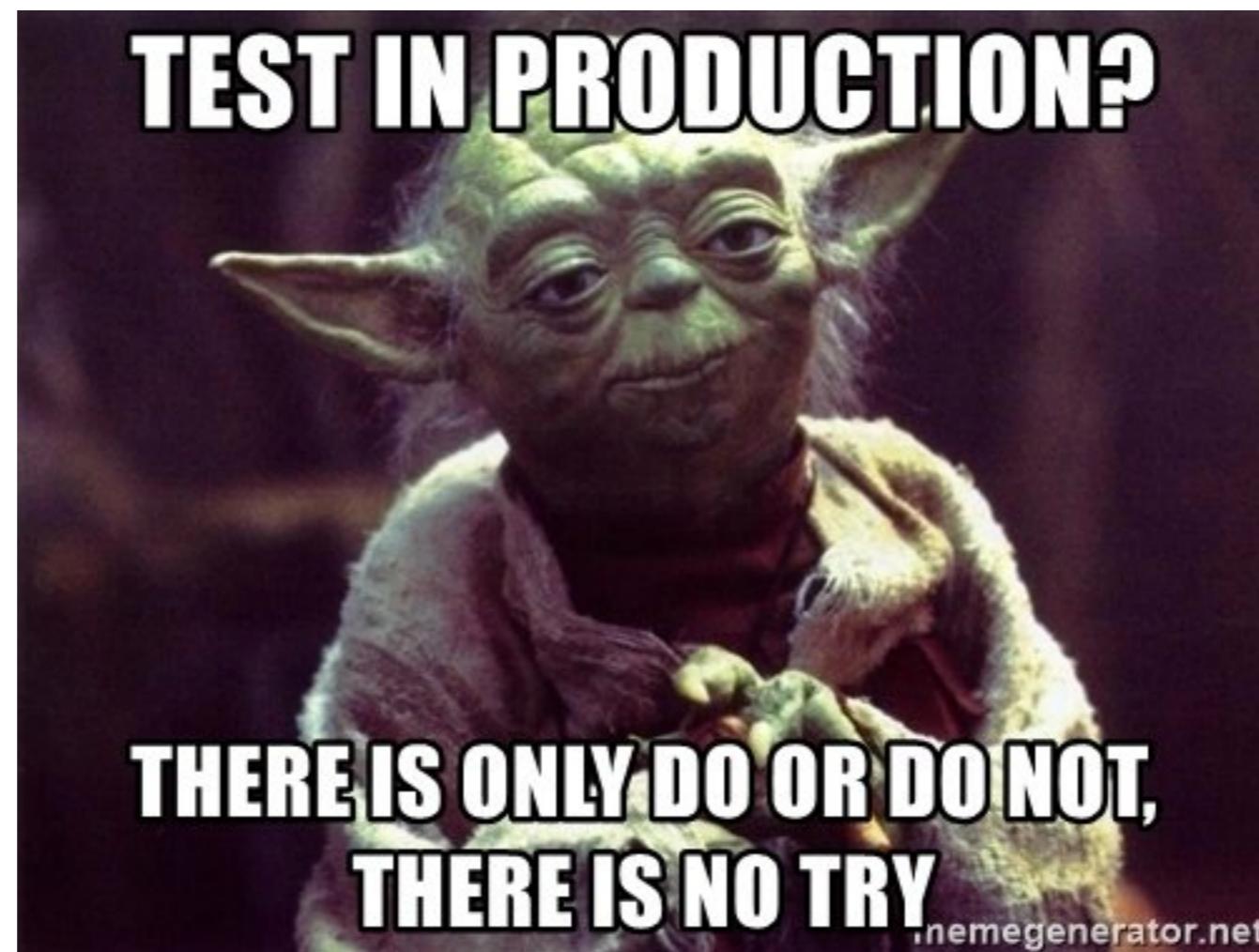
Keep the build **fast**

Continuous Integration is to provide rapid feedback



Practice 8

Test in clone of the **Production** environment



Practice 9

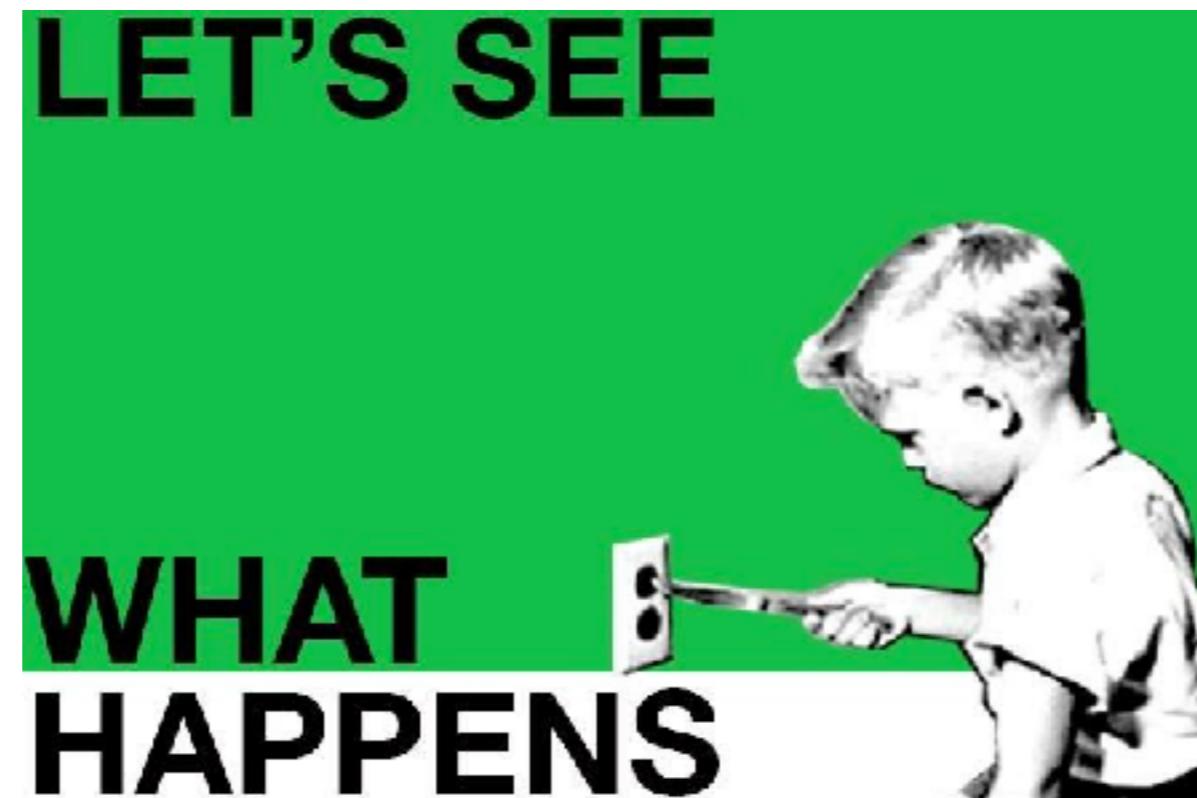
Make it easy for anyone to get
the latest executable

Make sure well known place where people can find



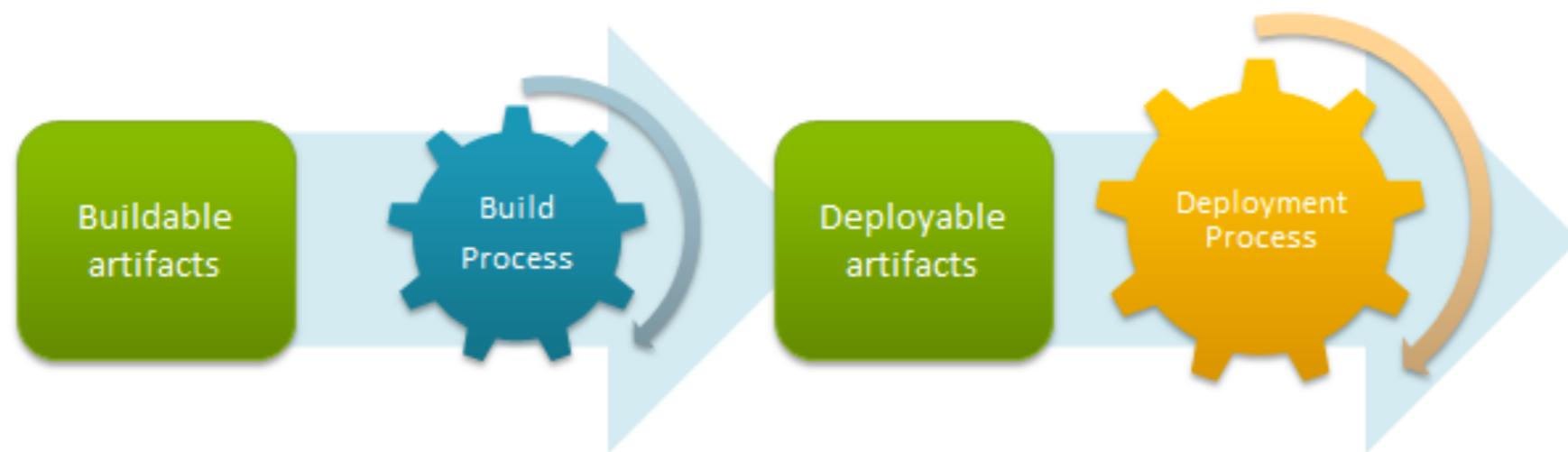
Practice 10

Everyone can see what's happening
Easier to see the state of the system and changes
Show the good information



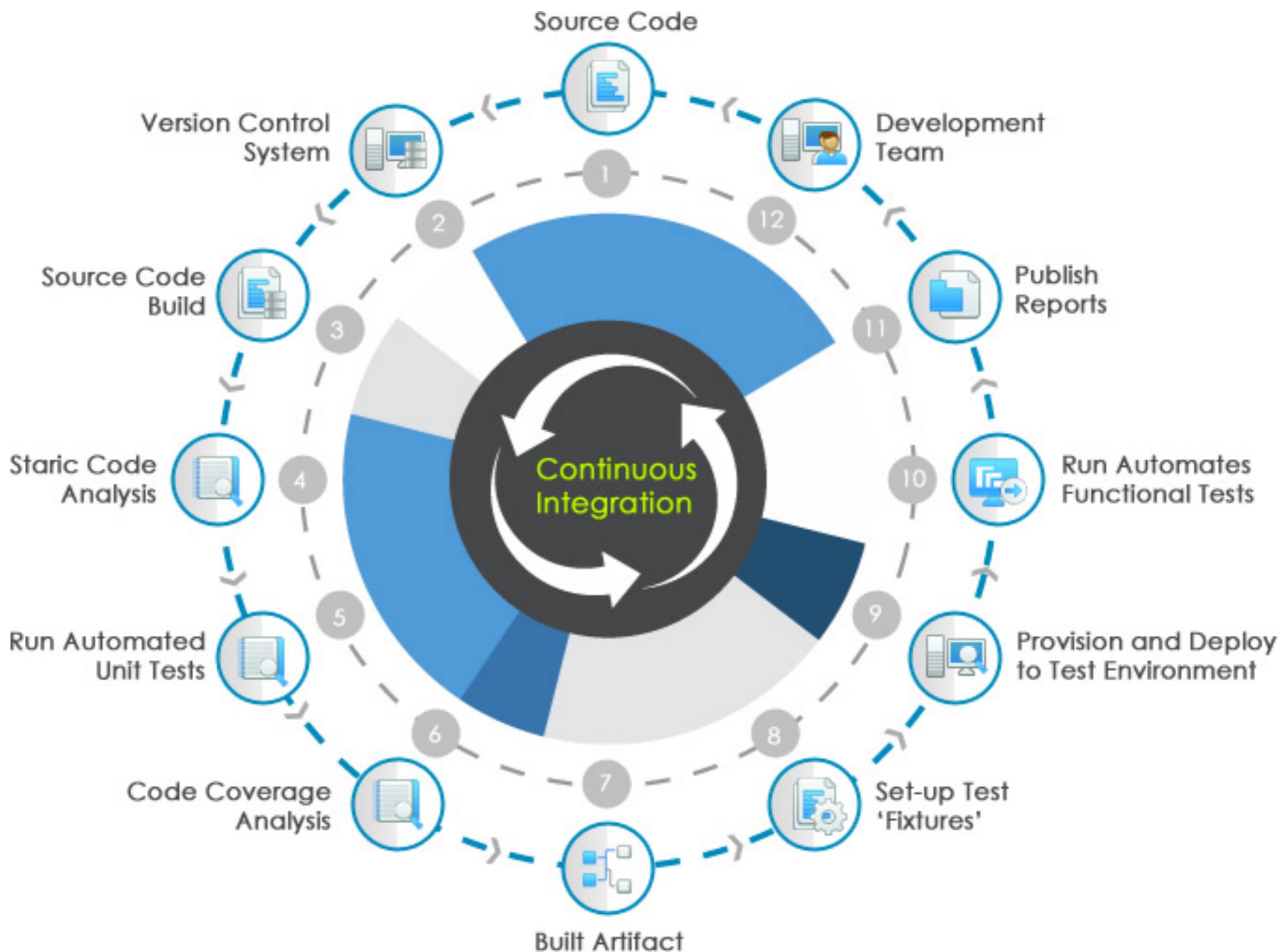
Practice 11

Automated deployment



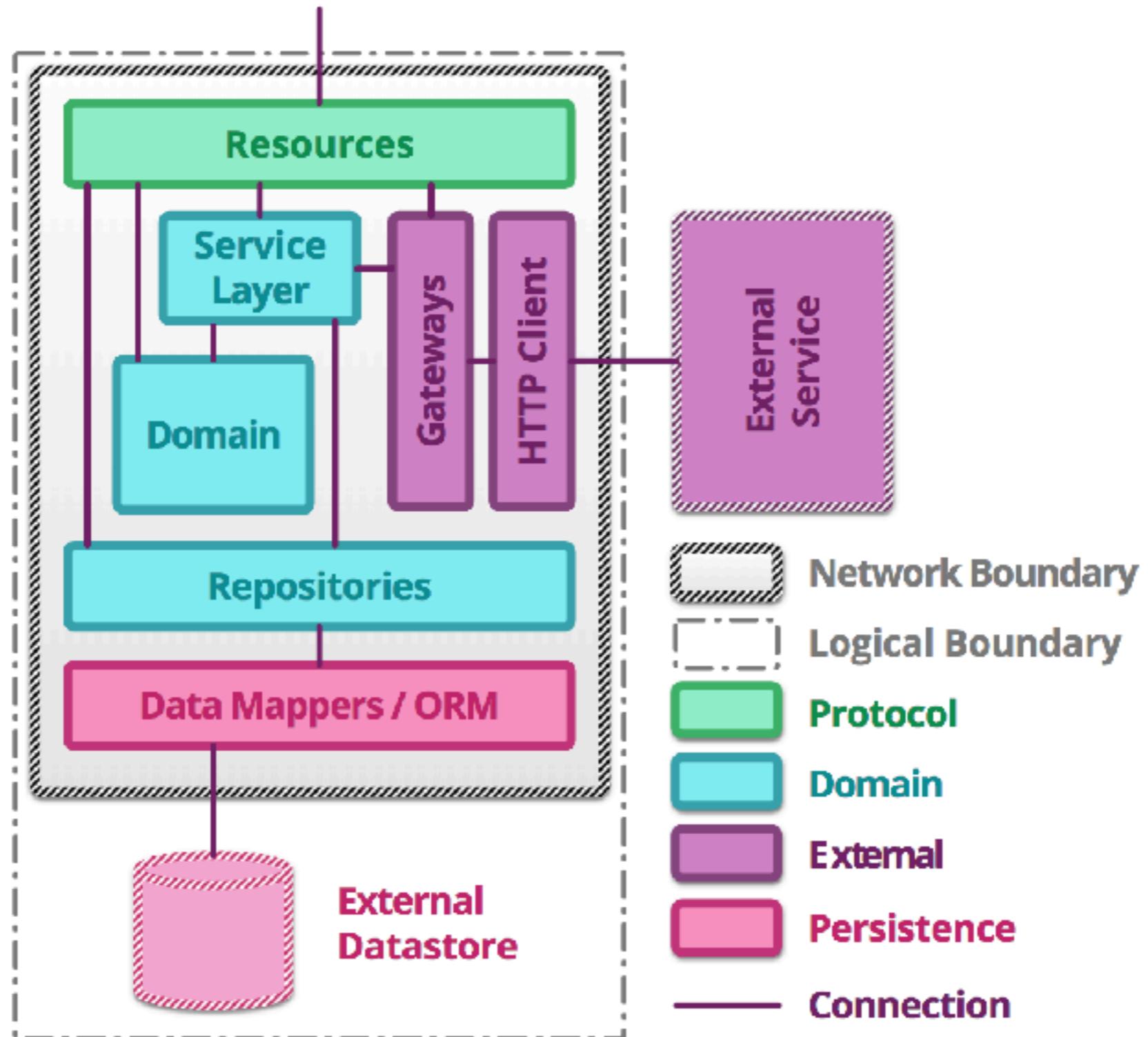
**“Behind every successful agile
project, there is a
Continuous Integration Server”**





Let's workshop





Development



Testing



Deployment



Summary

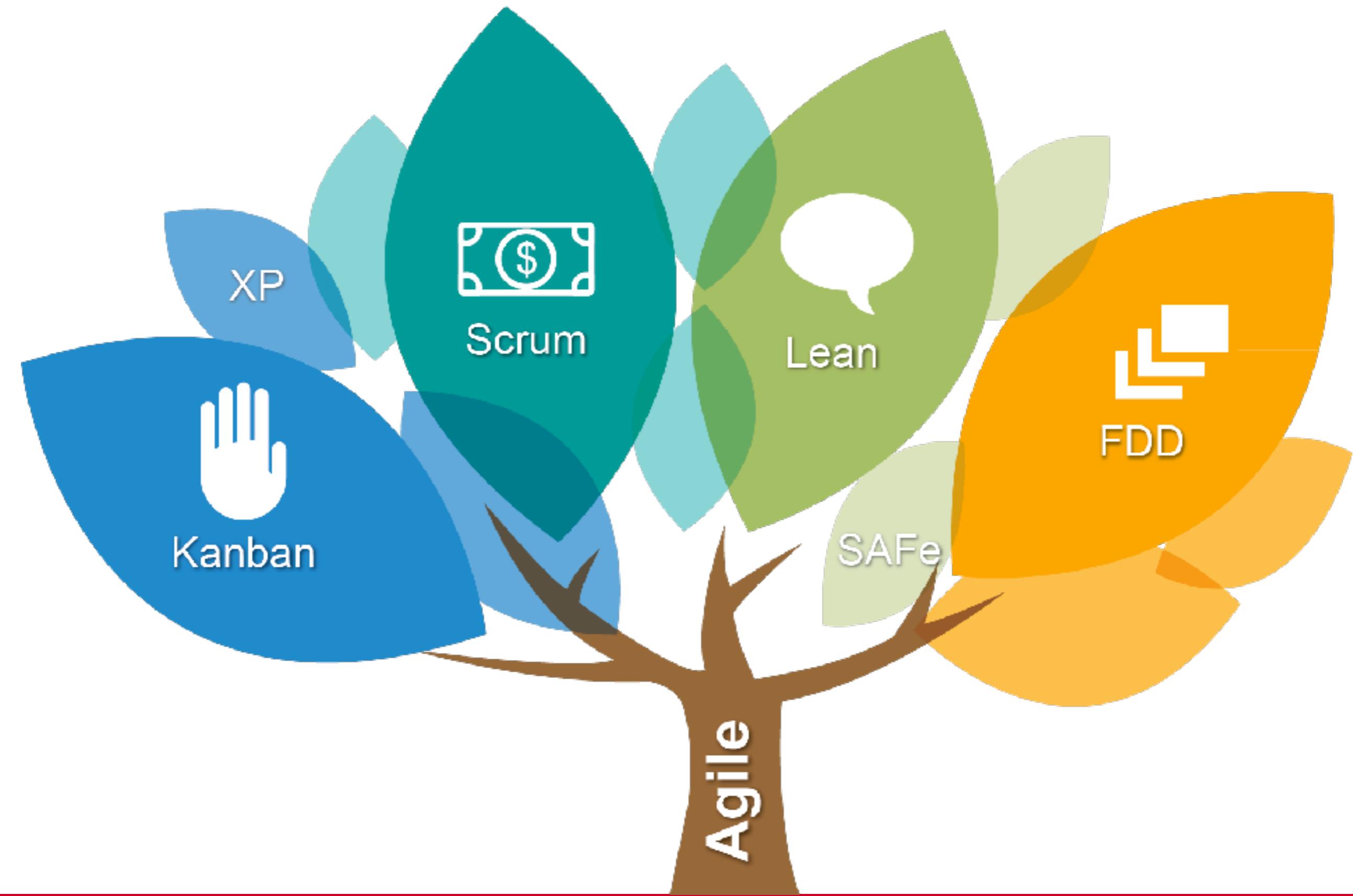


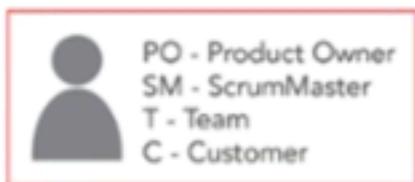


WATERFALL

AGILE







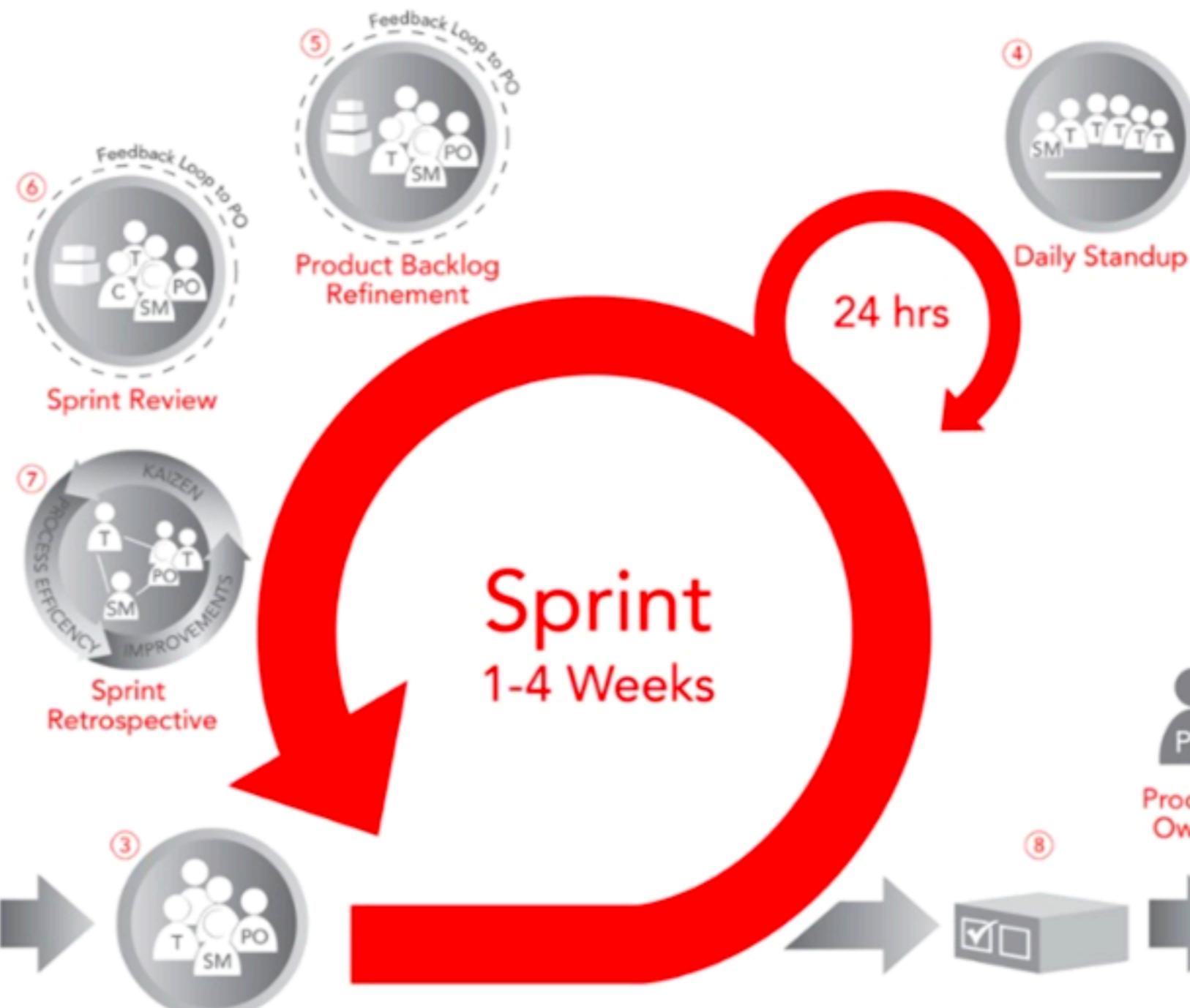
① Product Owner



Product Backlog (Features)

② Sprint Backlog (Stories)

Sprint Planning



⑧ Product Owner



Customer-Ready Product Increment

⑨ Incremental Product Release



Agile manifestos

THE AGILE MANIFESTO

We are uncovering better ways of developing software by doing it and helping others do it.

**CUSTOMER
COLLABORATION**
over contract negotiation

**RESPONDING TO
CHANGE**
over following a plan

**INDIVIDUALS AND
INTERACTIONS**
over processes and tools

**WORKING
SOFTWARE**
over full documentation



Agile principles

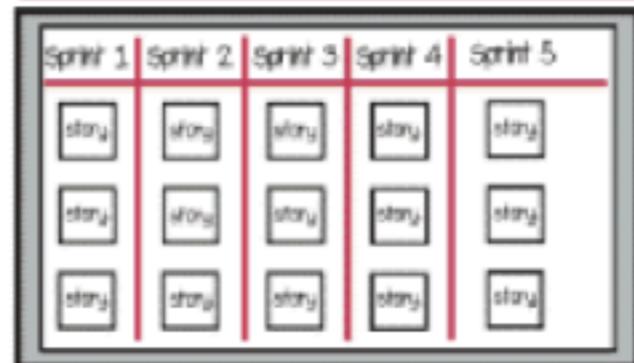
1 Satisfy the **customer**



Welcome **change**



Deliver **frequently**



4 Work **together**



5 Trust and **support**



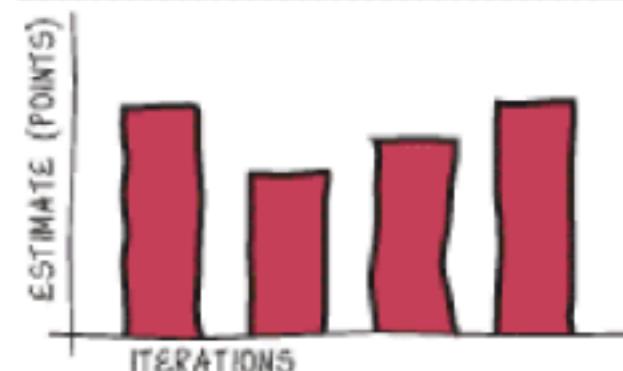
Face-to-face **conversation**



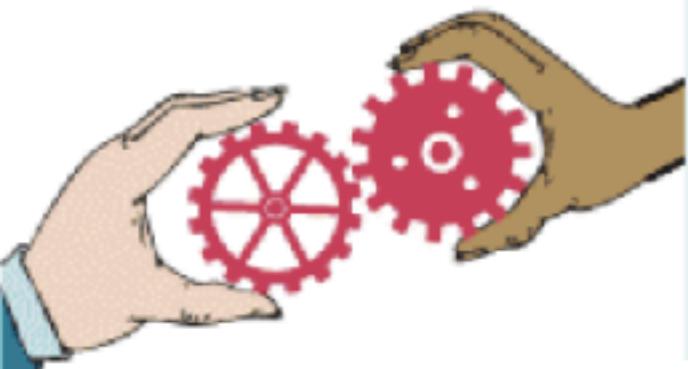
Working **software**



8 Sustainable **development**



9 **Technical** Excellence



10 Maintain **simplicity**



11 Self-organizing **teams**



12 Reflect and **adjust**



Origin by <https://www.knowledgetrain.co.uk>, modified by Jacky Shen



