aws SUMMIT

The Software Development Process at Amazon

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Managing Director Amazon Web Services Germany GmbH

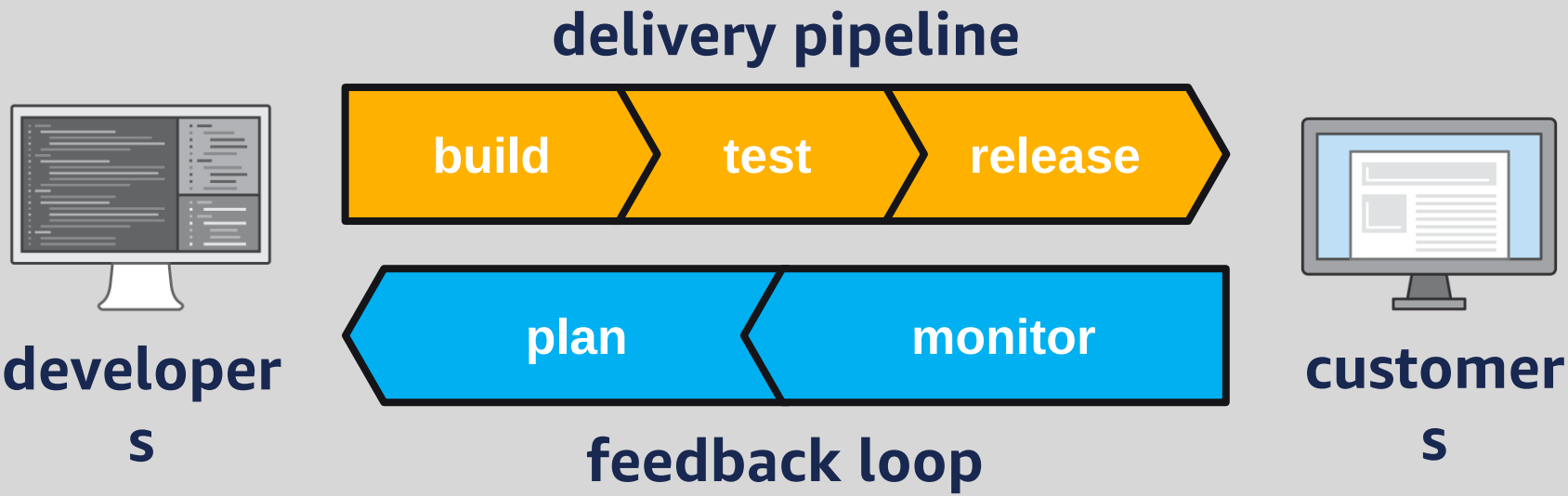
AWS OpsWorks, AWS Resource Groups, AWS Systems Manager

Amazon is hundreds of different businesses

AWS did over 1,430 major feature releases in 2017

No signs of slowing down

The Software Development Lifecycle



Ten Lessons Learned

1. Microservices
2. DevOps Teams
3. Self-Service Tools
4. Continuous Delivery
5. Pessimistic Deployments
6. Automated Testing
7. Optimize ECT Loop
8. Monitor Everything
9. Measure Everything
10. Listen to Customers

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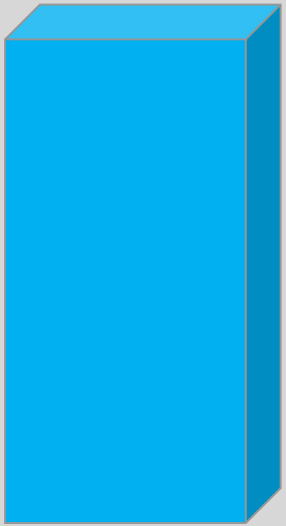
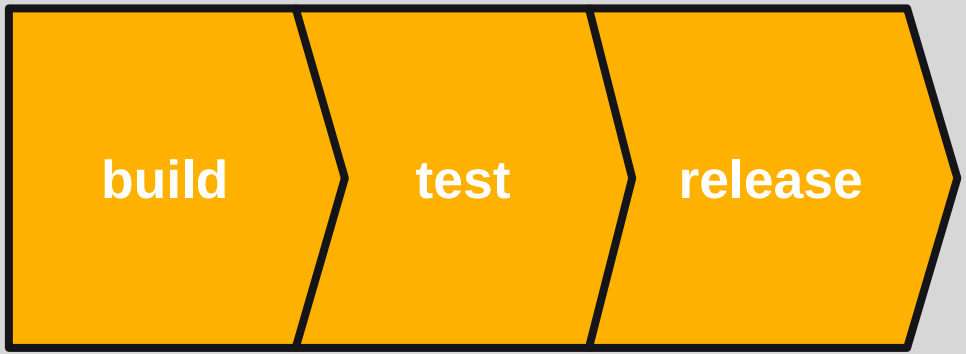
Let’s go back 15 years ago…

Monolith development lifecycle

developers



app



delivery pipeline

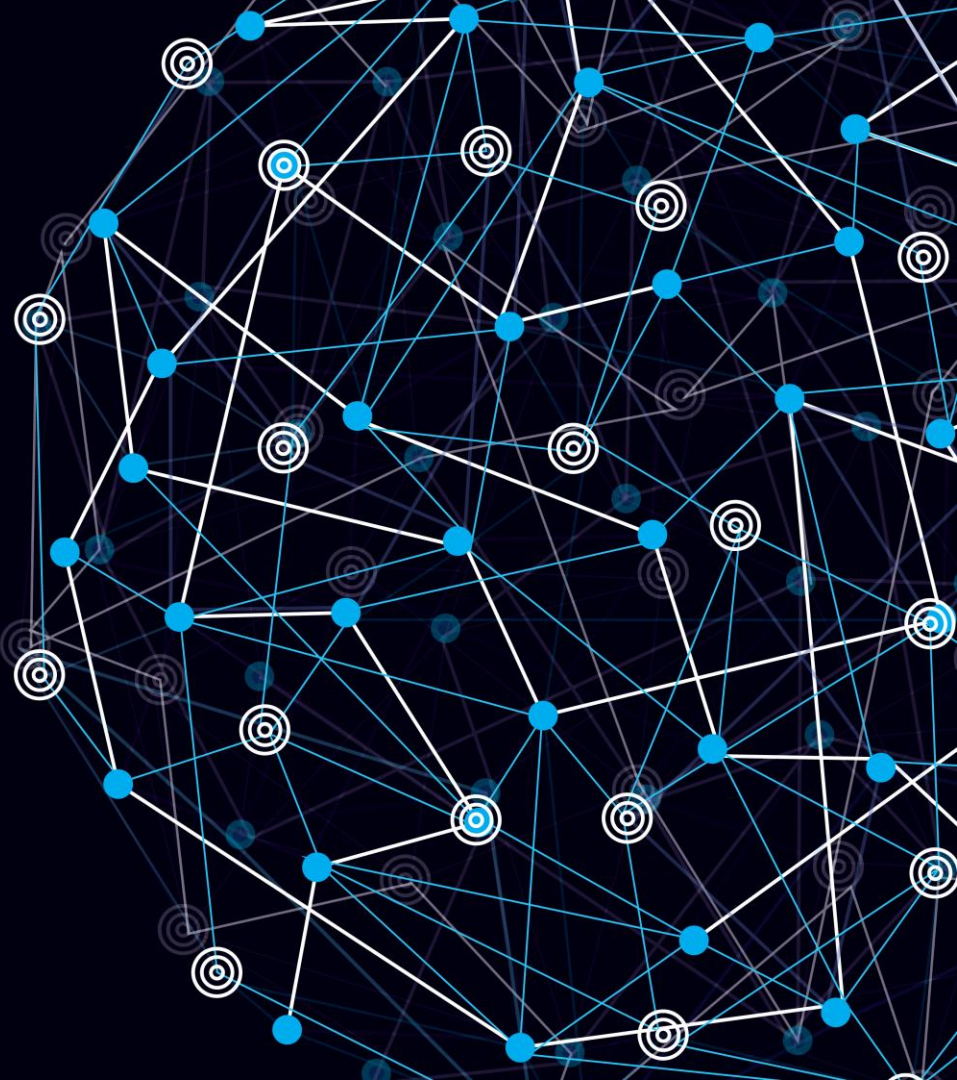
Service-Oriented Architecture (SOA)

Single-purpose Primitive

Connected w/ APIs

Highly decoupled

“Microservices”



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Two-pizza teams

Decentralized

Agility

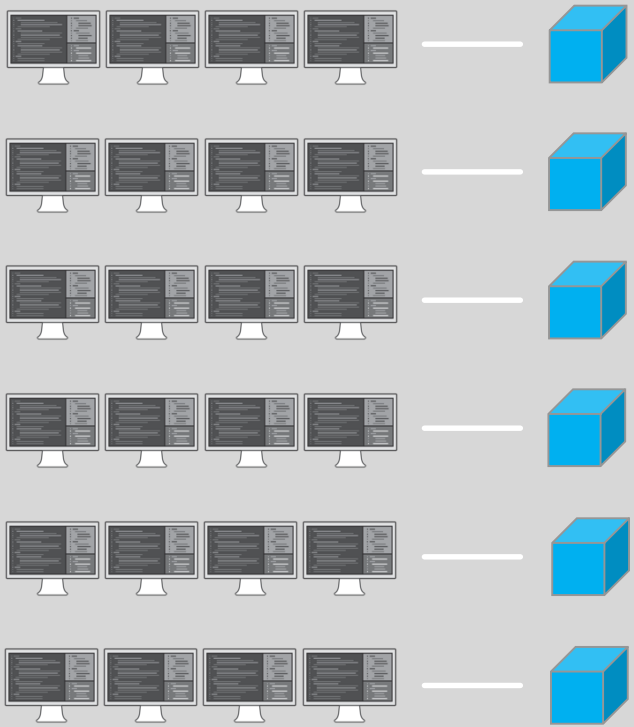
Autonomy

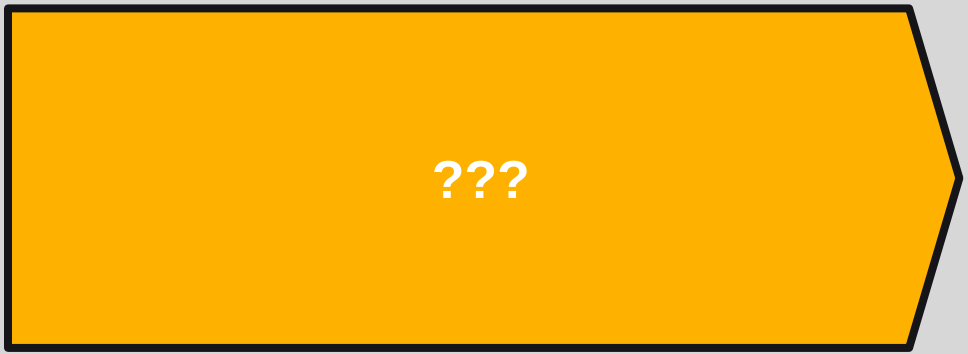
Accountability

Ownership

“DevOps”

Missing Tools





developers

services

delivery pipeline

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Self-service

Technology-agnostic

Encourage best practices

Single-purpose services

Deployment service

No downtime deployments

Health tracking

Versioned artifacts and rollbacks

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Pipelines

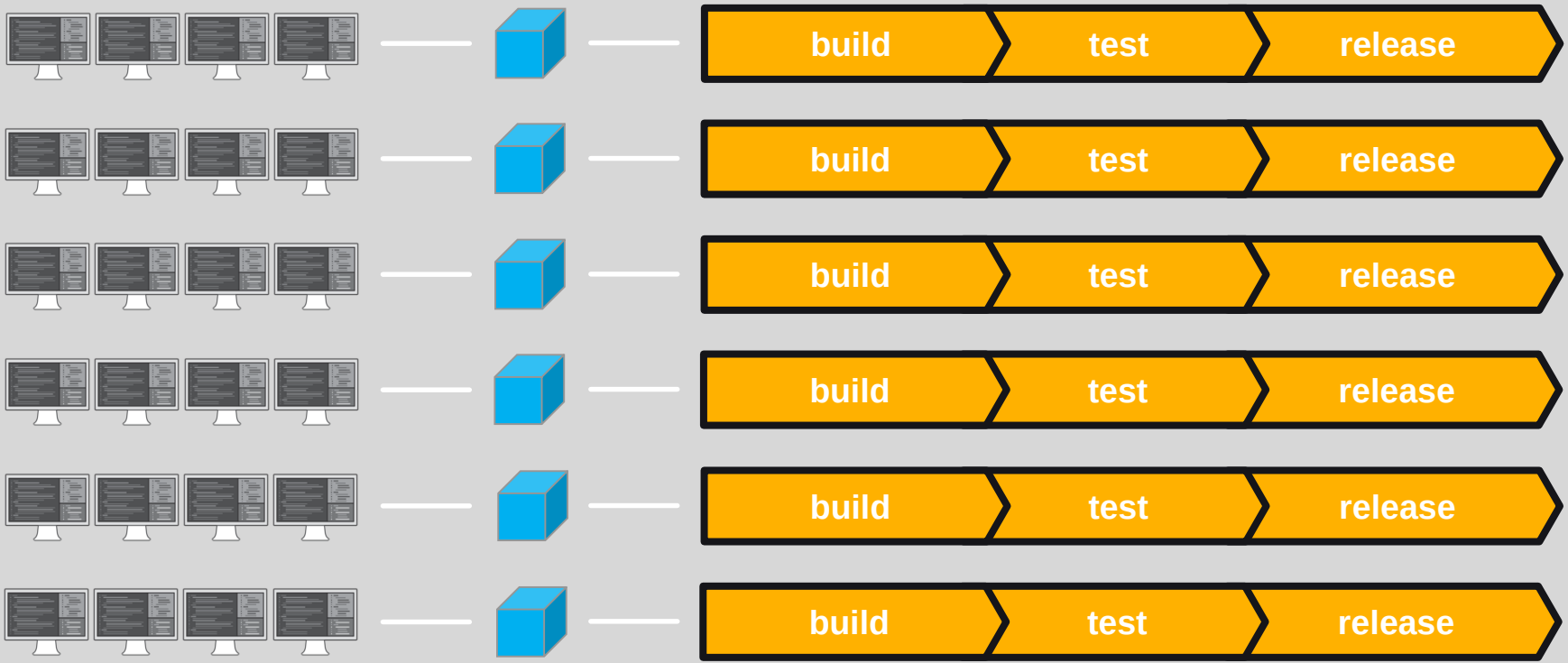
Continuous delivery

Automated release process

Faster & more reliable releases

Adopted by virtually all teams

Microsservice development lifecycle



developers

services

delivery pipelines

Thousands of teams
x Microservice architecture
x Continuous delivery
x Multiple environments

= millions of deployments

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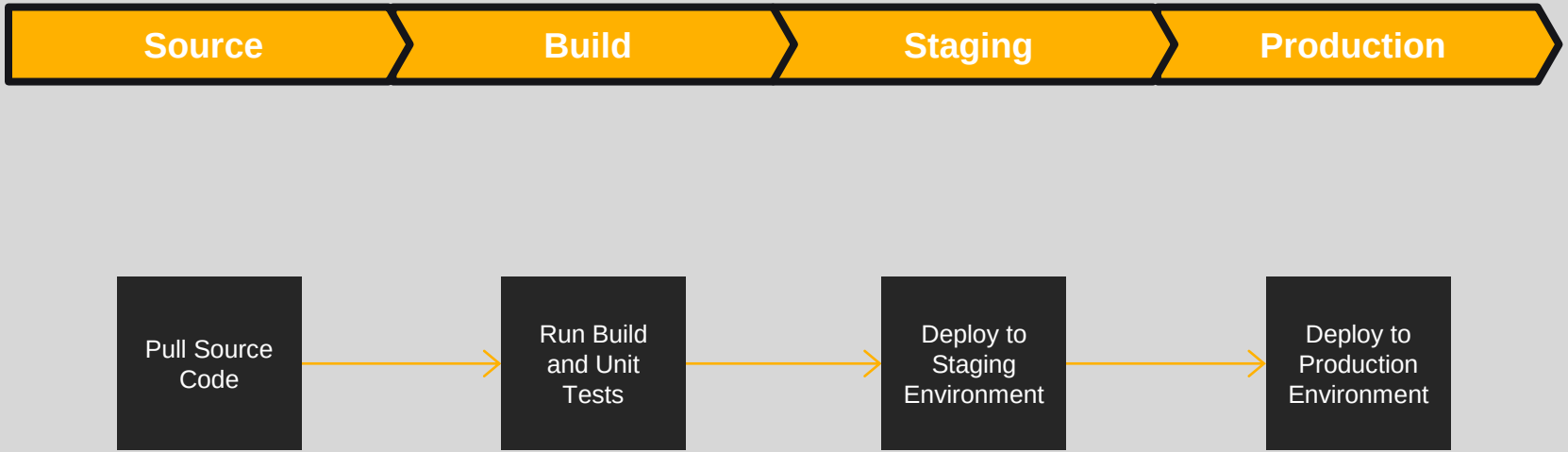
Release Pipelines



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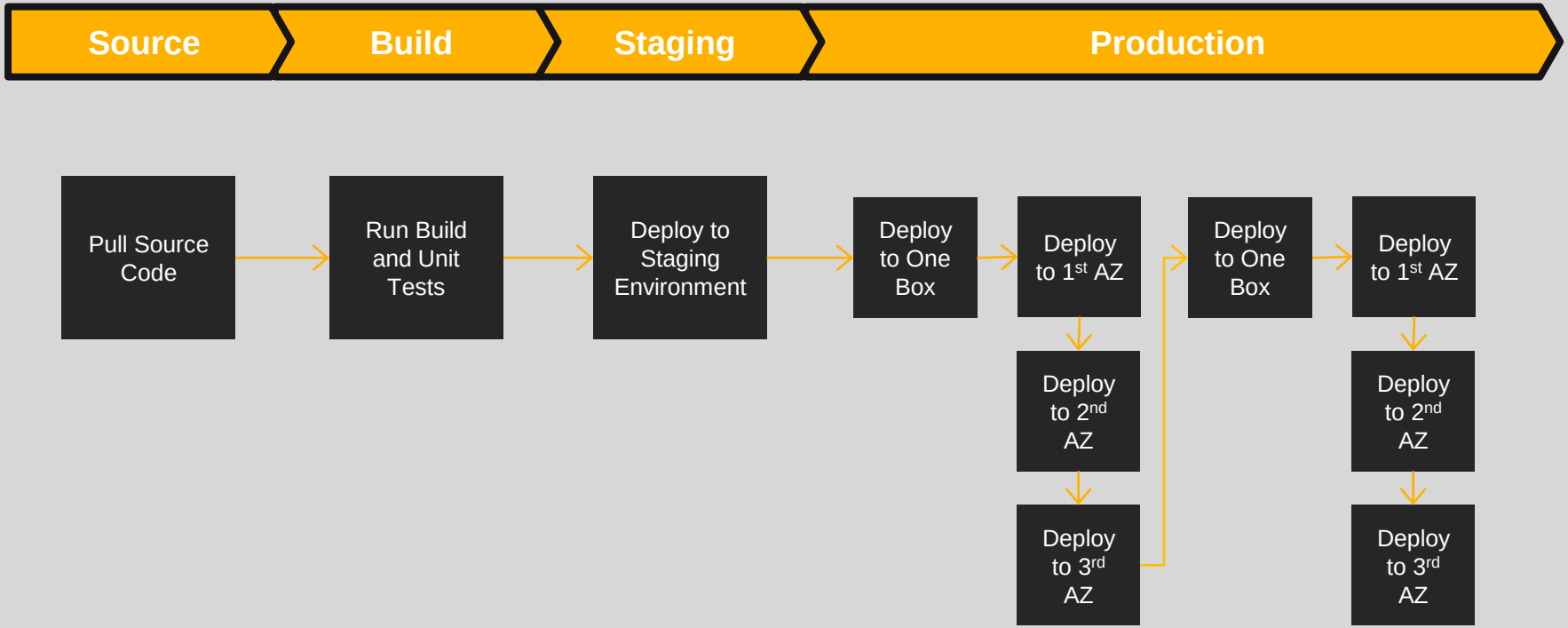

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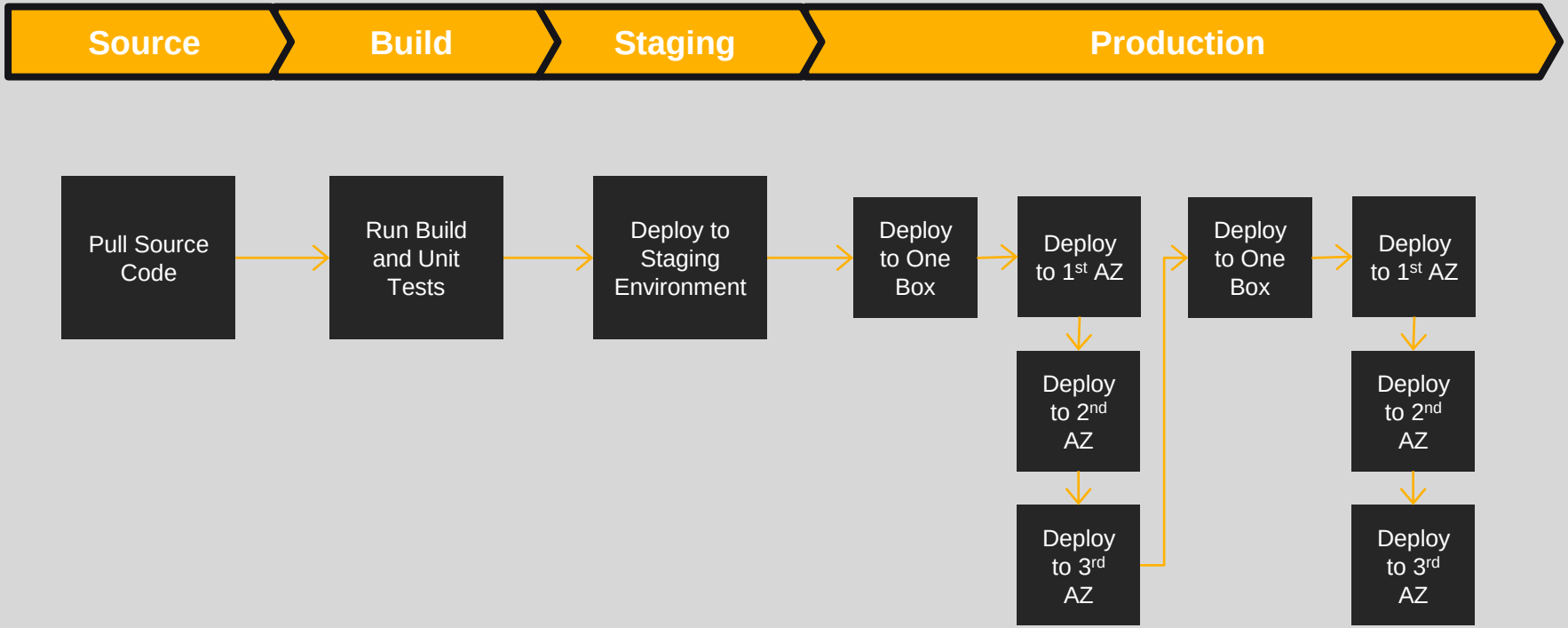

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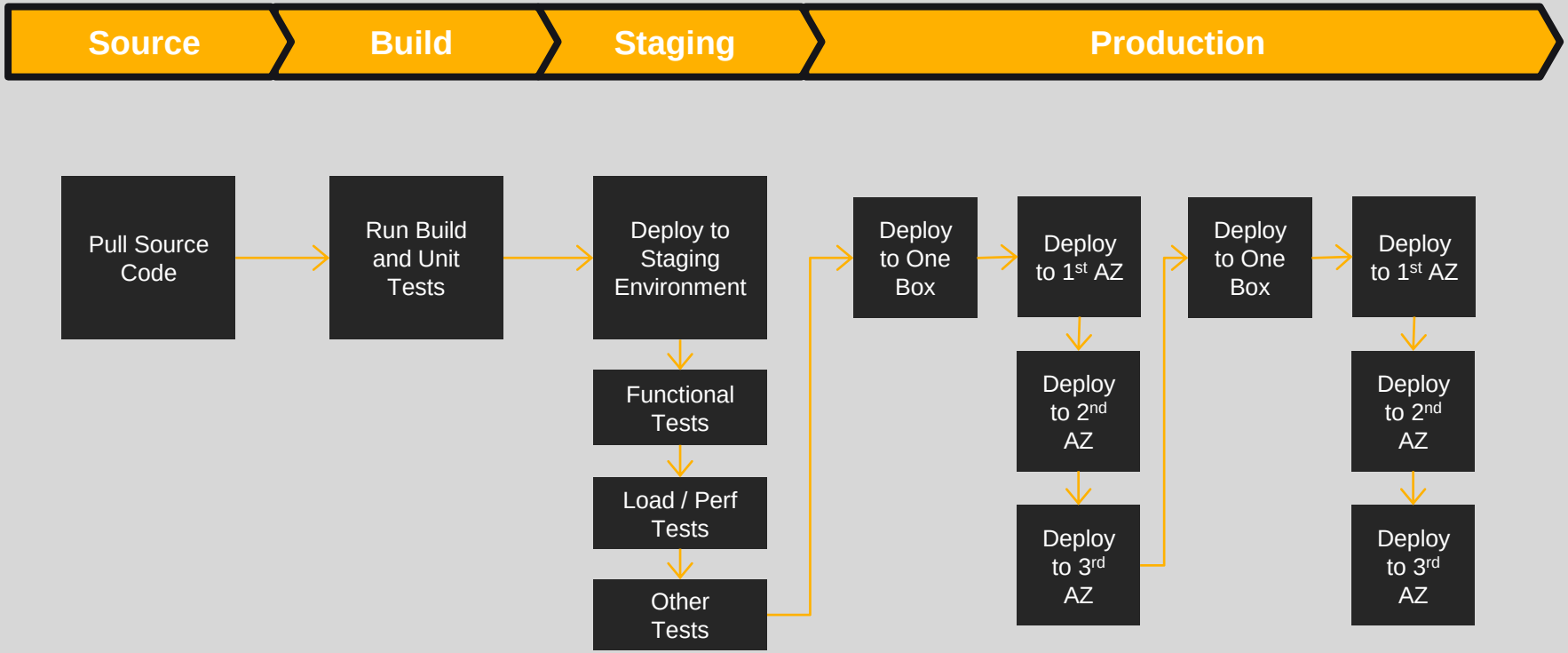

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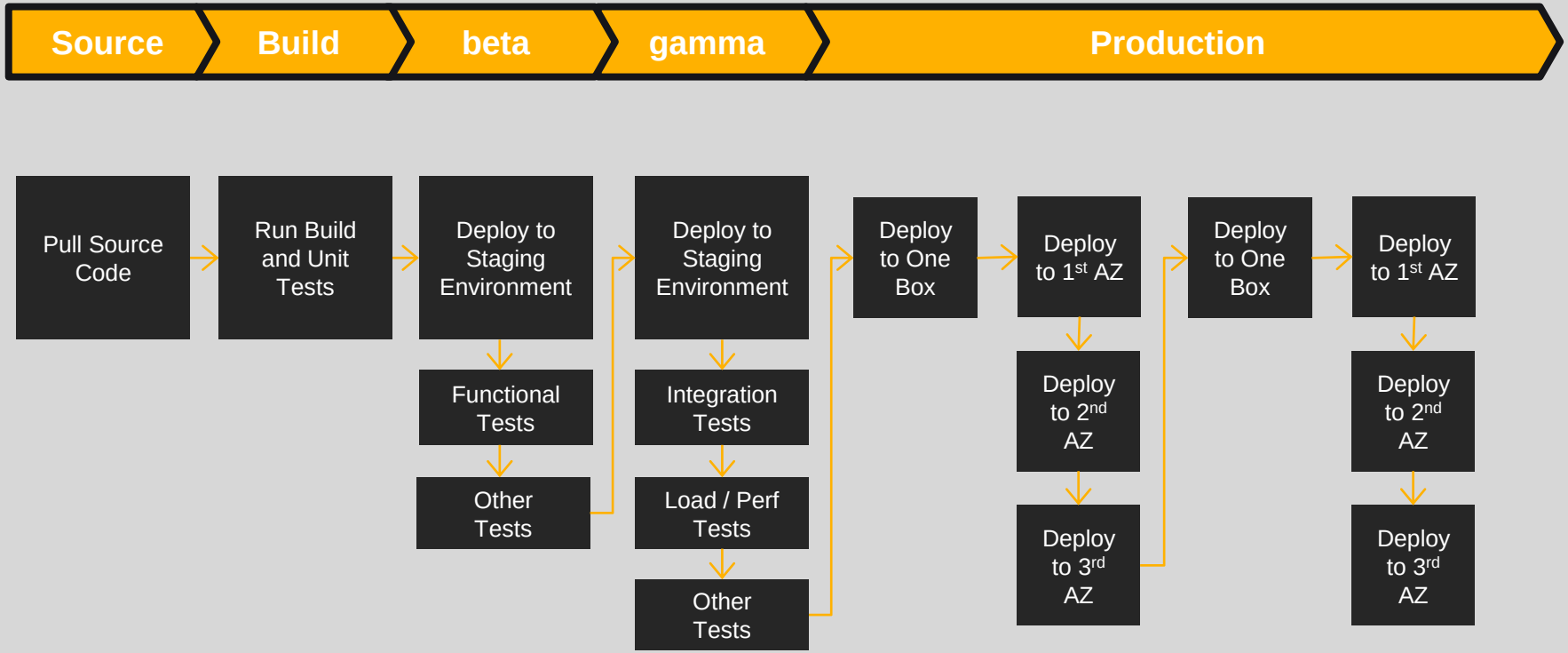

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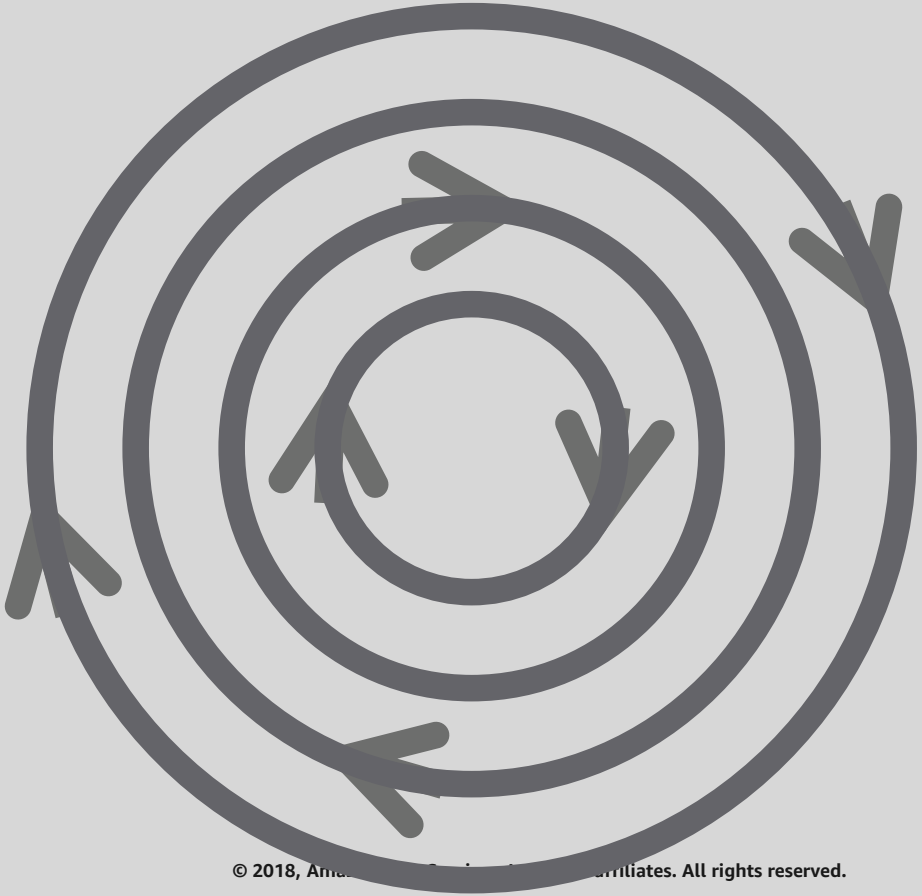
The Edit-Compile-Test Loop



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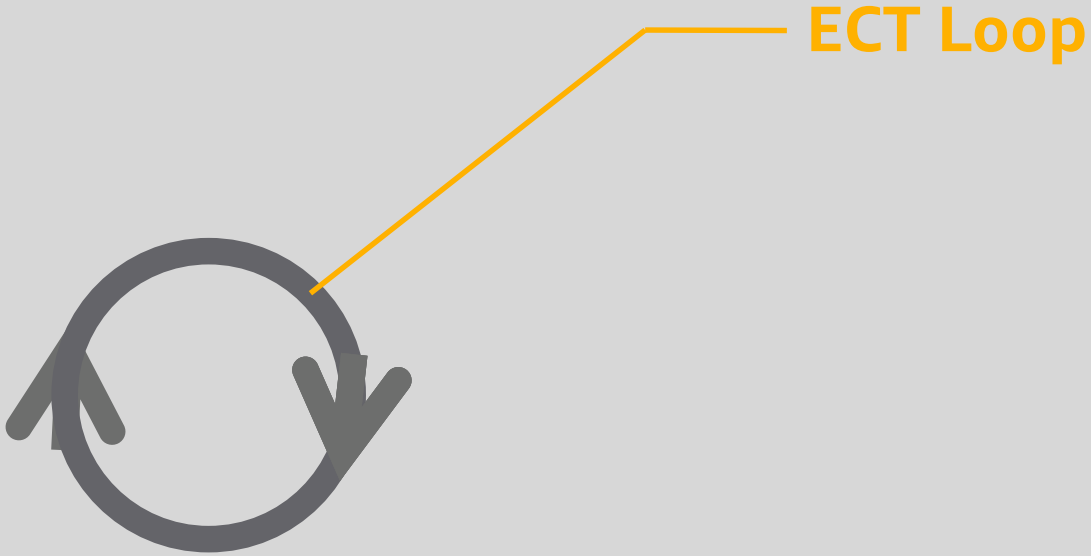
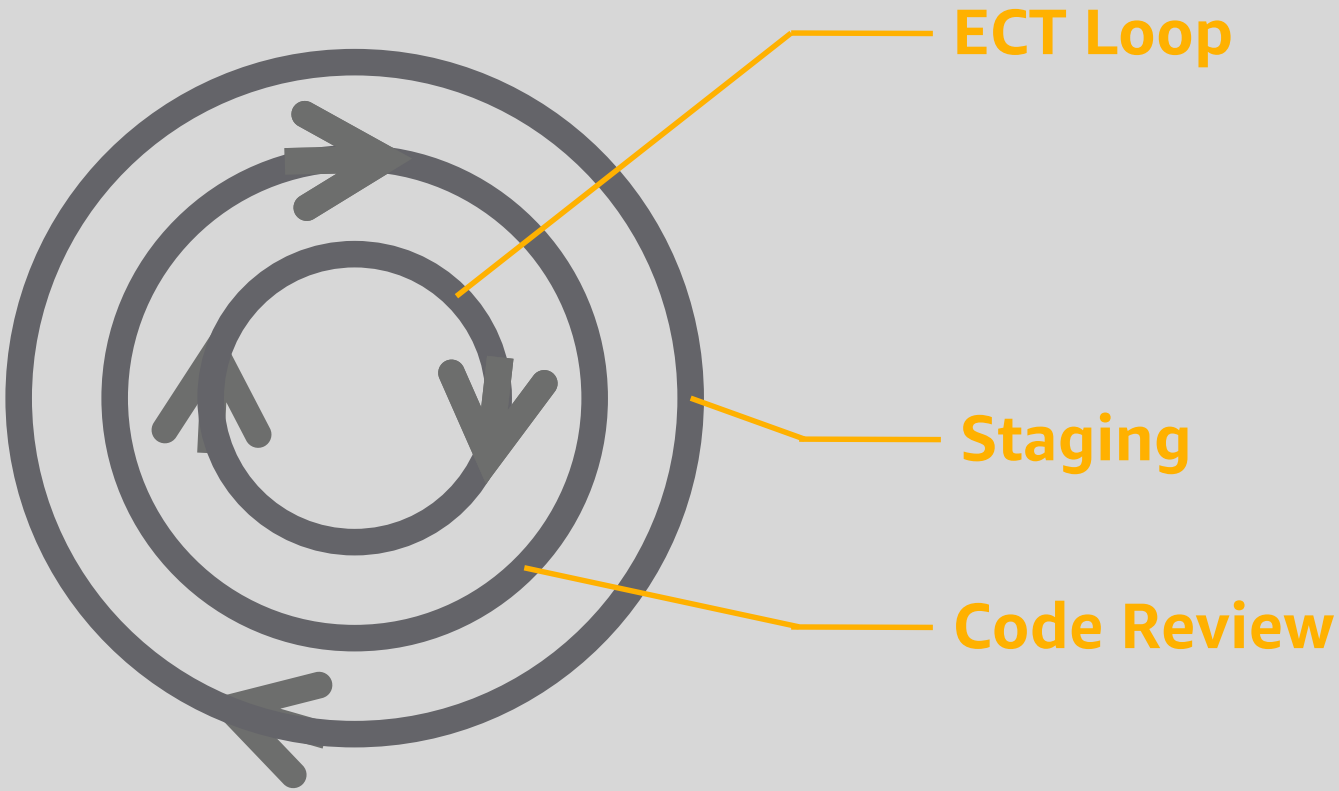


The Edit-Compile-Test Loop

ECT Loop

Code Review

The Edit-Compile-Test Loop



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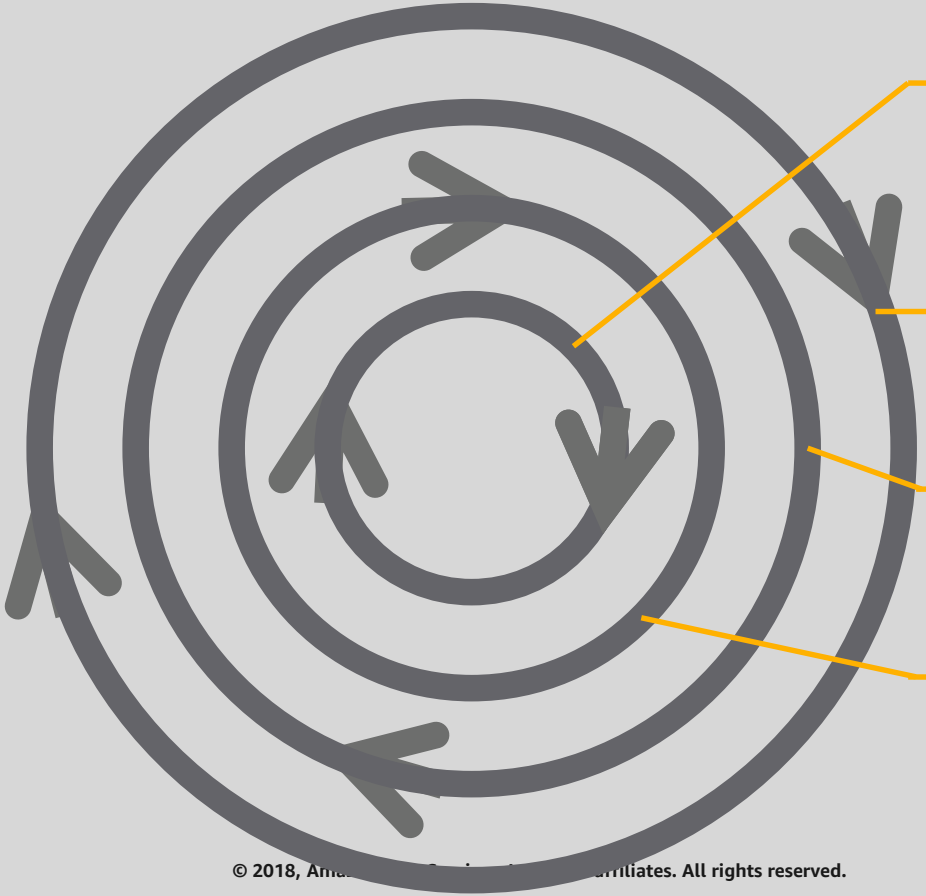
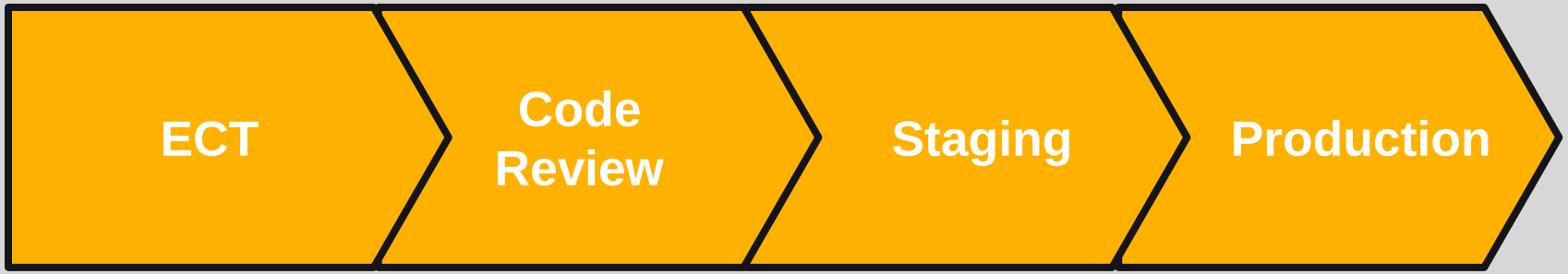


Catching Problems in the Development Lifecycle



Ideal Place	Great Place	Good Place	Last Resort
✓ ✓ ✓	✓ ✓	✓	–

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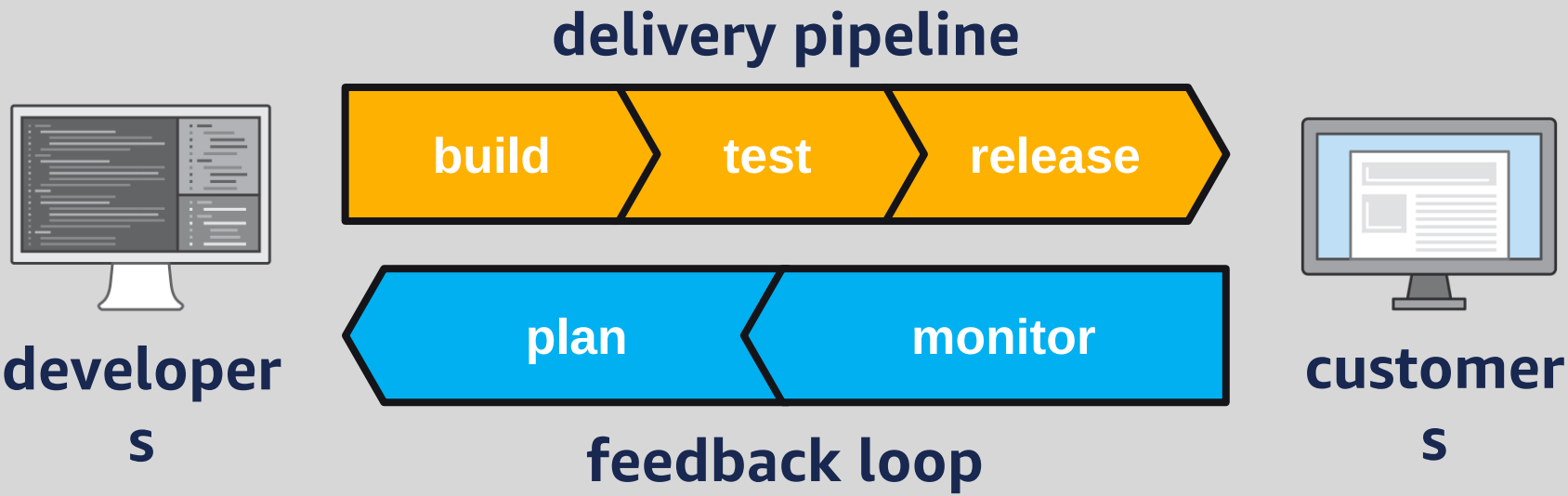

Ops Culture

Ops Meetings

Ops Dashboards

- resource monitoring
- application monitoring
- canary monitoring
- client-side monitoring
- “order drop rate”

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Data Culture

WBR Meetings

Metrics Decks

- feature adoption
- segment growth
- funnel analysis
- cost structure

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Listen

It's easy to be right if you just listen to customers.

1. **Ask them want they want**
2. **Get feedback on what you build**
3. **Course correct if need to**

Feature vs. Need

Wenger 16999 Swiss Army Knife Giant
https://www.amazon.com/Wenger-16999-Swiss-Knife-Giant/dp/B001DZTJRQ

All Things Distributed

Werner Vogels' weblog on building scalable and robust distributed systems.

Working Backwards

By Werner Vogels on 01 November 2006 05:42 AM | Permalink | Comments ()

In the fine grained services approach that we use at Amazon, services do not only represent a software structure but also the organizational structure. The services have a strong ownership model, which combined with the small team size is intended to make it very easy to innovate. In some sense you can see these services as small startups within the walls of a bigger company. Each of these services require a strong focus on who their customers are, regardless whether they are externally or internally. To ensure that a service meets the needs of the customer (and not more than that) we use a process called "*Working Backwards*" in which you start with your customer and work your way backwards until you get to the minimum set of technology requirements to satisfy what you try to achieve. The goal is to drive simplicity through a continuous, explicit customer focus.

The product definition process works backwards in the following way: we start by writing the documents we'll need at launch (the press release and the faq) and then work towards documents that are closer to the implementation.

The Working Backwards product definition process is all about is fleshing out the concept and achieving clarity of thought about what we will ultimately go off and build. It typically has four steps:

1. **Start by writing the Press Release**. Nail it. The press release describes in a simple way what the product does and why it exists - what are the features and benefits. It needs to be very clear and to the point. Writing a press release up front clarifies how the world will see the product - not just how we think about it internally.
2. **Write a Frequently Asked Questions document**. Here's where we add meat to the skeleton provided by the press release. It includes questions that came up when we wrote the press release. You would include questions that other folks asked when you shared the press release and you include questions that define what the product is good for. You put yourself in the shoes of someone using the product and consider all the questions you would have.
3. **Define the customer experience**. Describe in precise detail the customer experience for the different things a customer might do with the product. For products with a user interface, we would build mock ups of each screen that the customer uses. For web services, we write use cases, including code snippets, which describe ways you can imagine people using the product. The goal here is to tell stories of how a customer is solving their problems using the product.
4. **Write the User Manual**. The user manual is what a customer will use to really find out about what the product is and how they will use it. The user manual typically has three sections, concepts, how-to, and reference, which between them tell the customer everything they need to know to use the product. For products with more than one kind of user, we write more than one user manual.

Once we have gone through the process of creating the press release, faq, mockups, and user manuals, it is amazing how much clearer it is what you are planning to build. We'll have a suite of documents that we can use to explain the new product to other teams within Amazon. We know at that point that the whole team has a shared vision on what product we are going the build.

Contact Info

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Other places

Follow werner on twitter if you want to know what he is current reading or thinking about.
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www.allthingsdistributed.com/2006/11/working_backwards.html

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aws SUMMIT

Thank you

Two reminders:

Please complete the session survey in the summit mobile app.

AWS DevDay with Chef in Berlin on
June 12th - https://bit.ly/2sp8kxo