DevOps in a nutshell

Dirk Lehmann, SAP

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About me

- With SAP since 2001
- Implemented the first daily delivery process at SAP with twogo (2014)
- Current job: Operations at SAP CP ABAP Environment (a.k.a. Steampunk)
- Co-Organizer DevOpsDays Zurich
  https://devopsdays.ch
- Conference speaker
  https://doergn.github.io/
- @doergn

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There is no Canonical Definition of DevOps

“a cross-disciplinary community of practice dedicated to the study of building, evolving and operating rapidly-changing resilient systems at scale.”

Jez Humble

“DevOps is... an umbrella concept that refers to anything that smoothes out the interaction between development and operations.”

Damon Edwards

“DevOps is a cultural and professional movement.
The best way to describe devops is in terms of patterns and anti-patterns.”

Adam Jacobs

“the emerging professional movement that advocates a collaborative working relationship between Development and IT Operations, resulting in the fast flow of planned work (i.e., high deploy rates), while simultaneously increasing the reliability, stability, resilience and security of the production environment.”

Gene Kim

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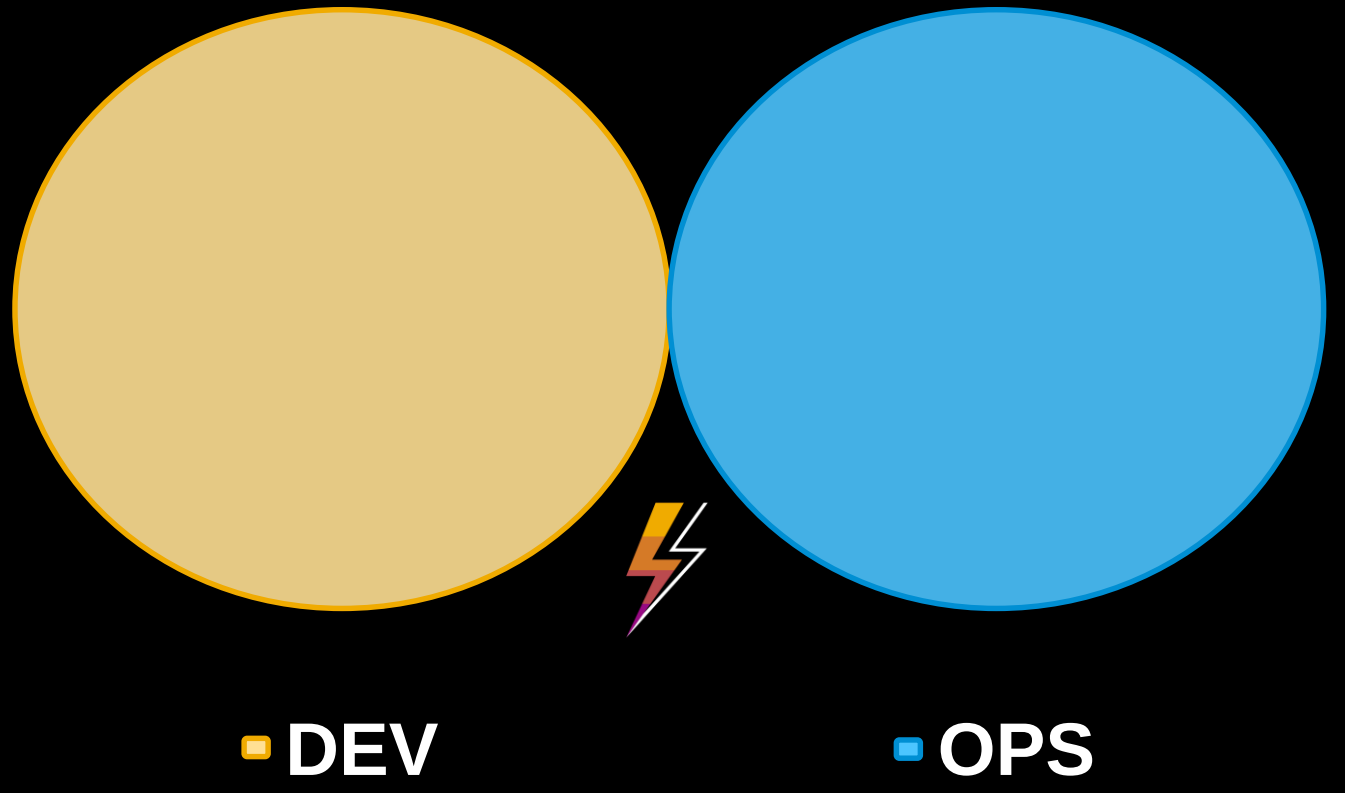
What’s the problem?



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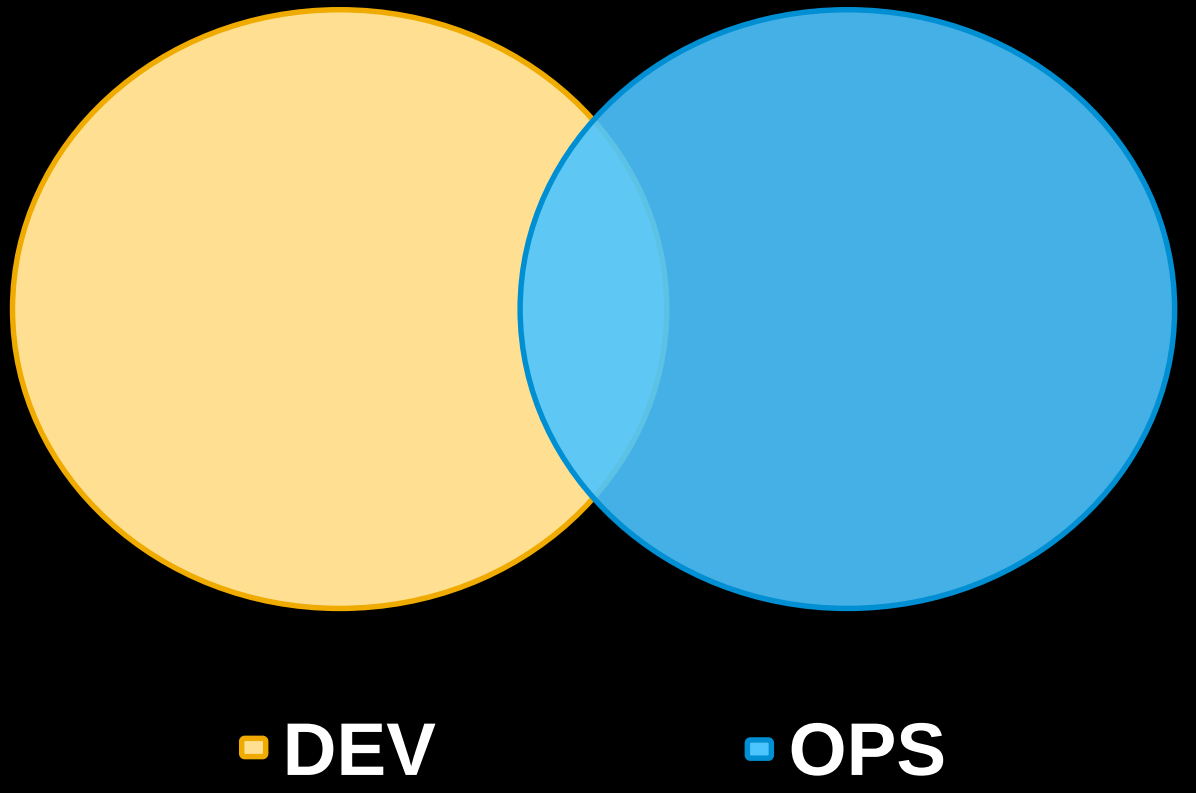
What’s the solution?



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Development + Operations = DevOps
That was easy!

- The term DevOps is **bad**. Really **bad**. Like really really **bad**!
  - It started as “Agile Operations”, turned into DevOps and at the time everyone realized it was a terrible mistake the term was already established.

- What about…
  - Security? → *DevSecOps?*
  - Business? → *DevBizOps?*
  - Quality? → *DevQOps?*
  - UA? → *DevUAOps?*
  - …

Don‘t try to create a new bad term. Let‘s live with one bad term: DevOps

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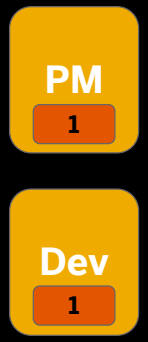

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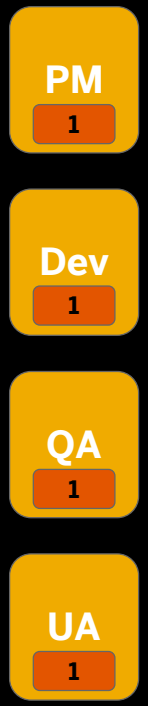

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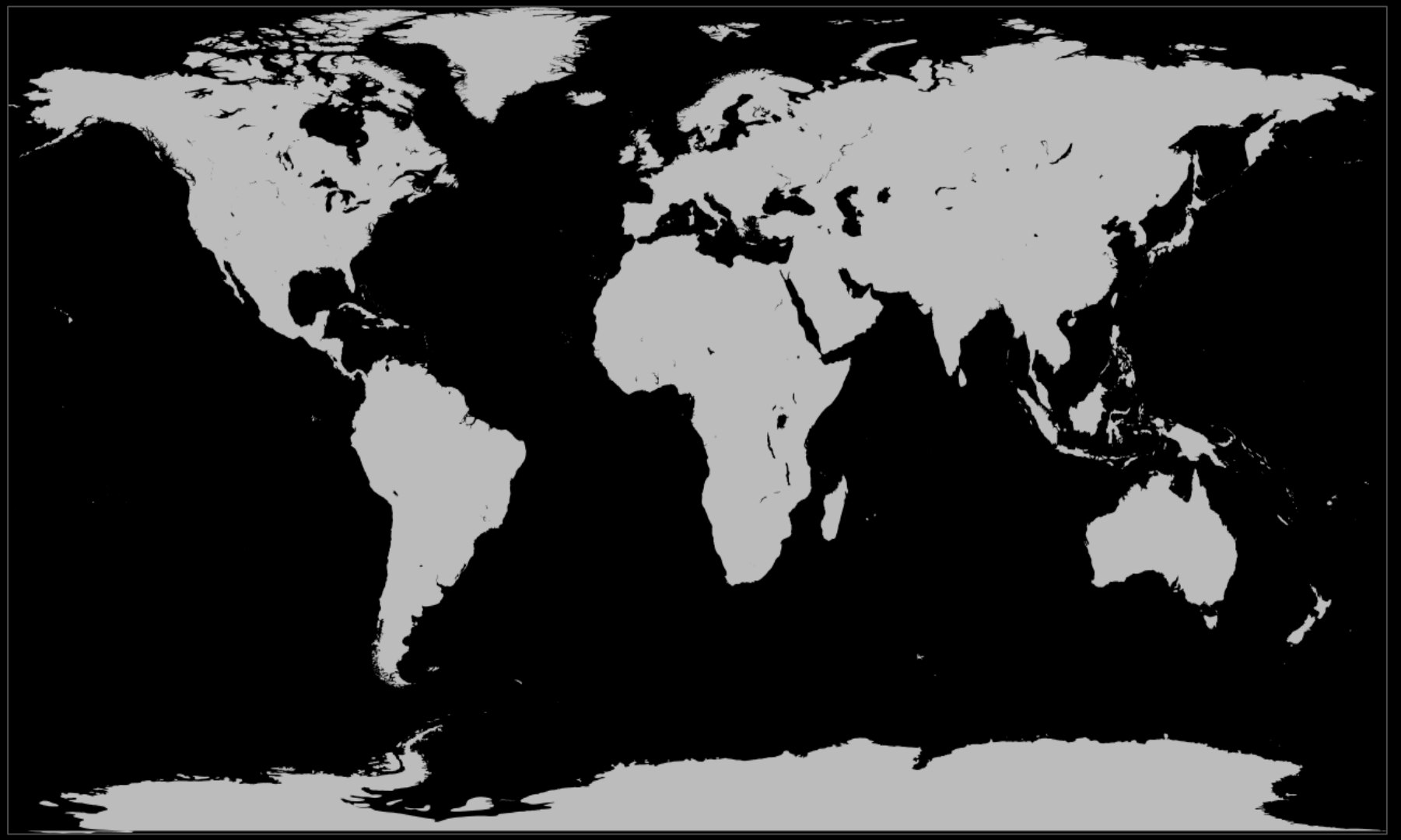
PM 1

Dev 1

QA 1

UA 1

Ops 1



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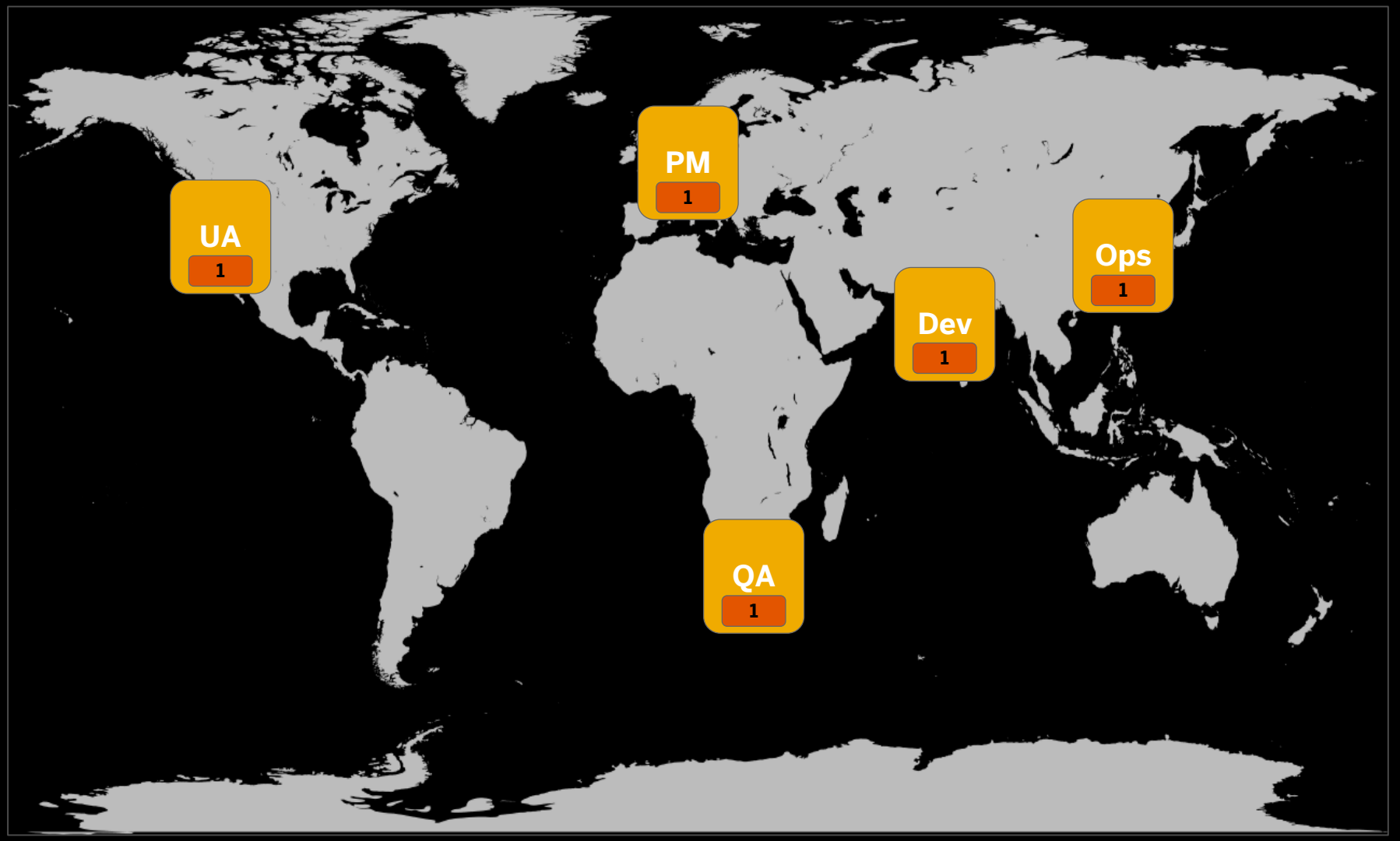

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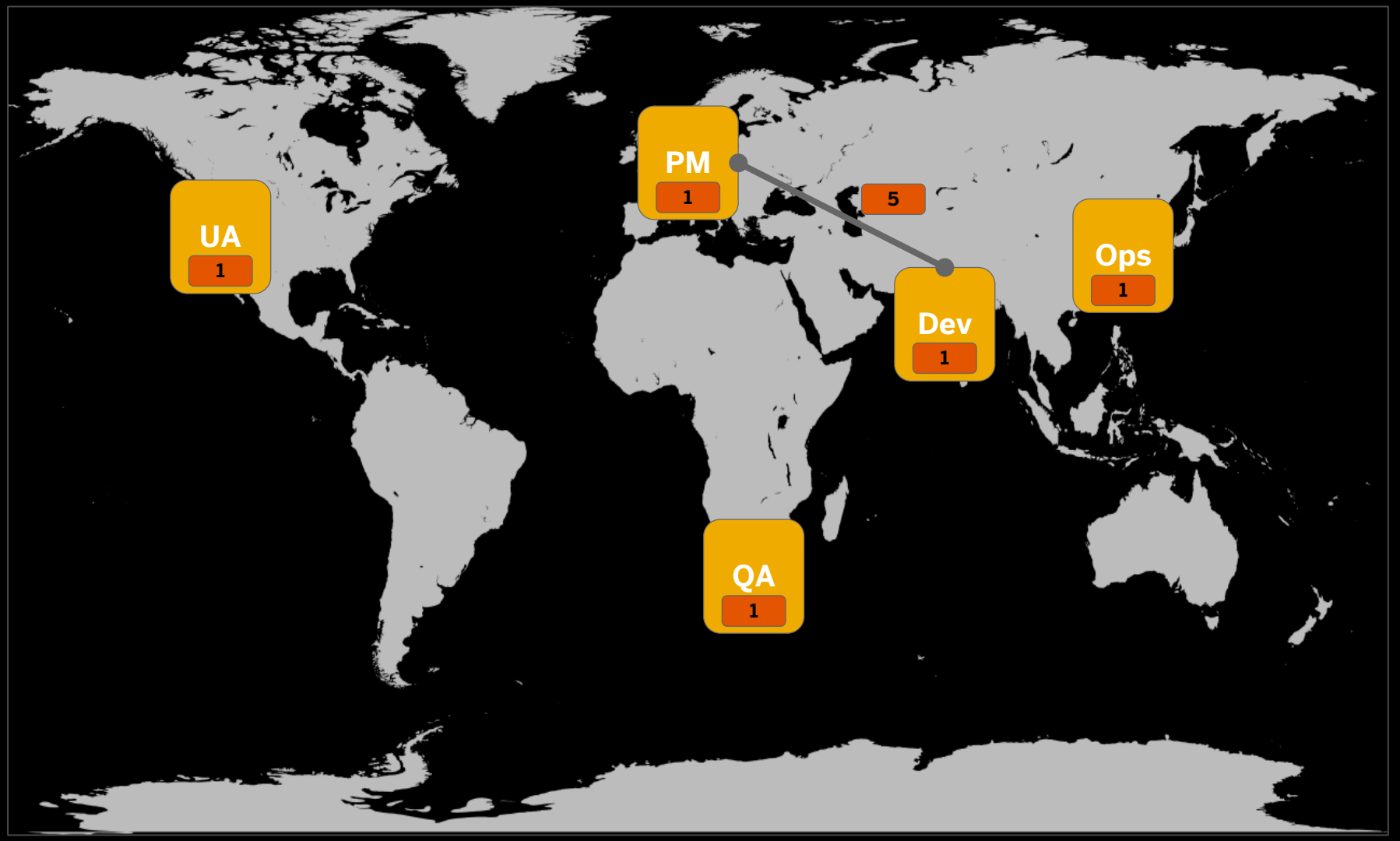

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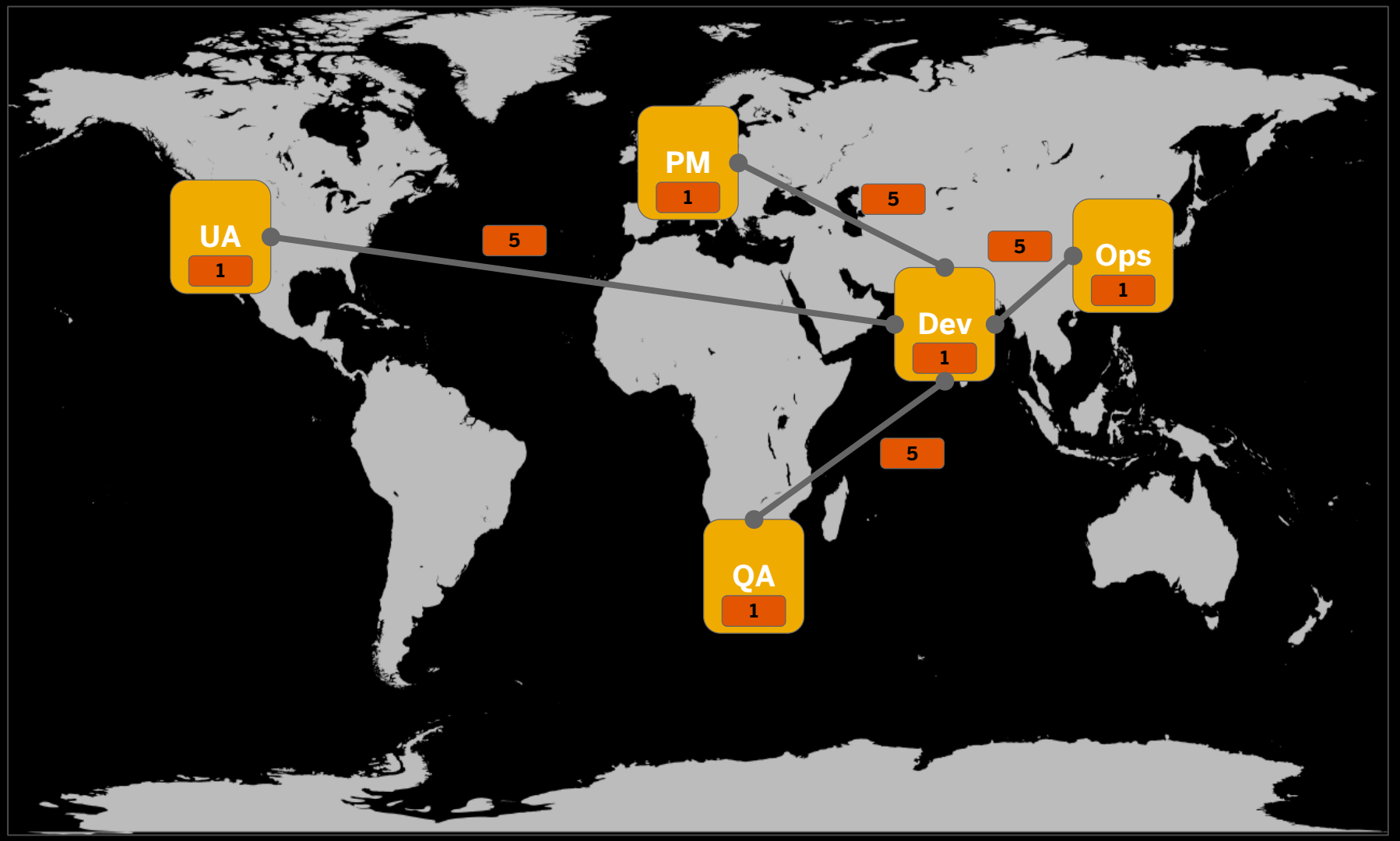

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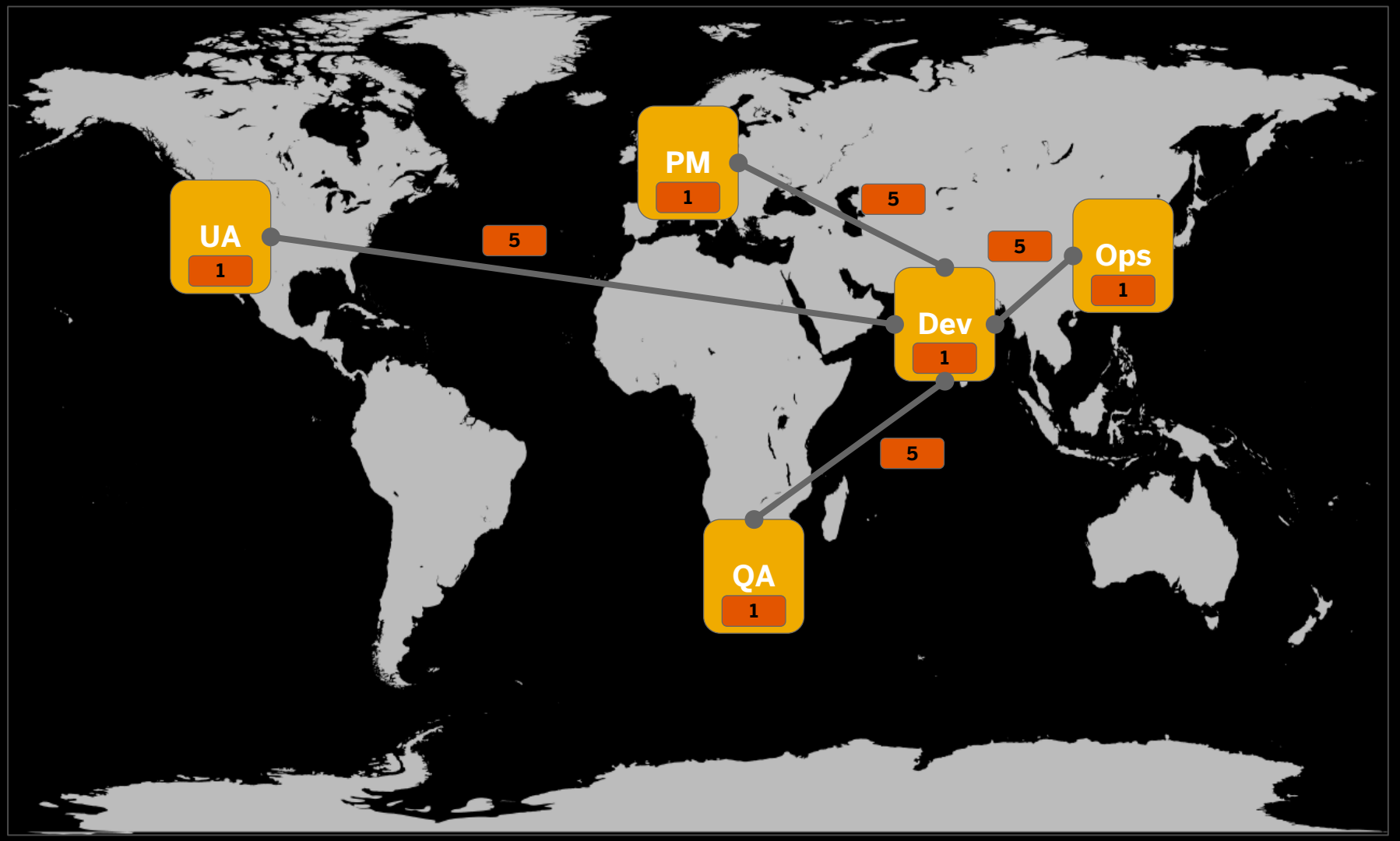

Lead time:

25 days

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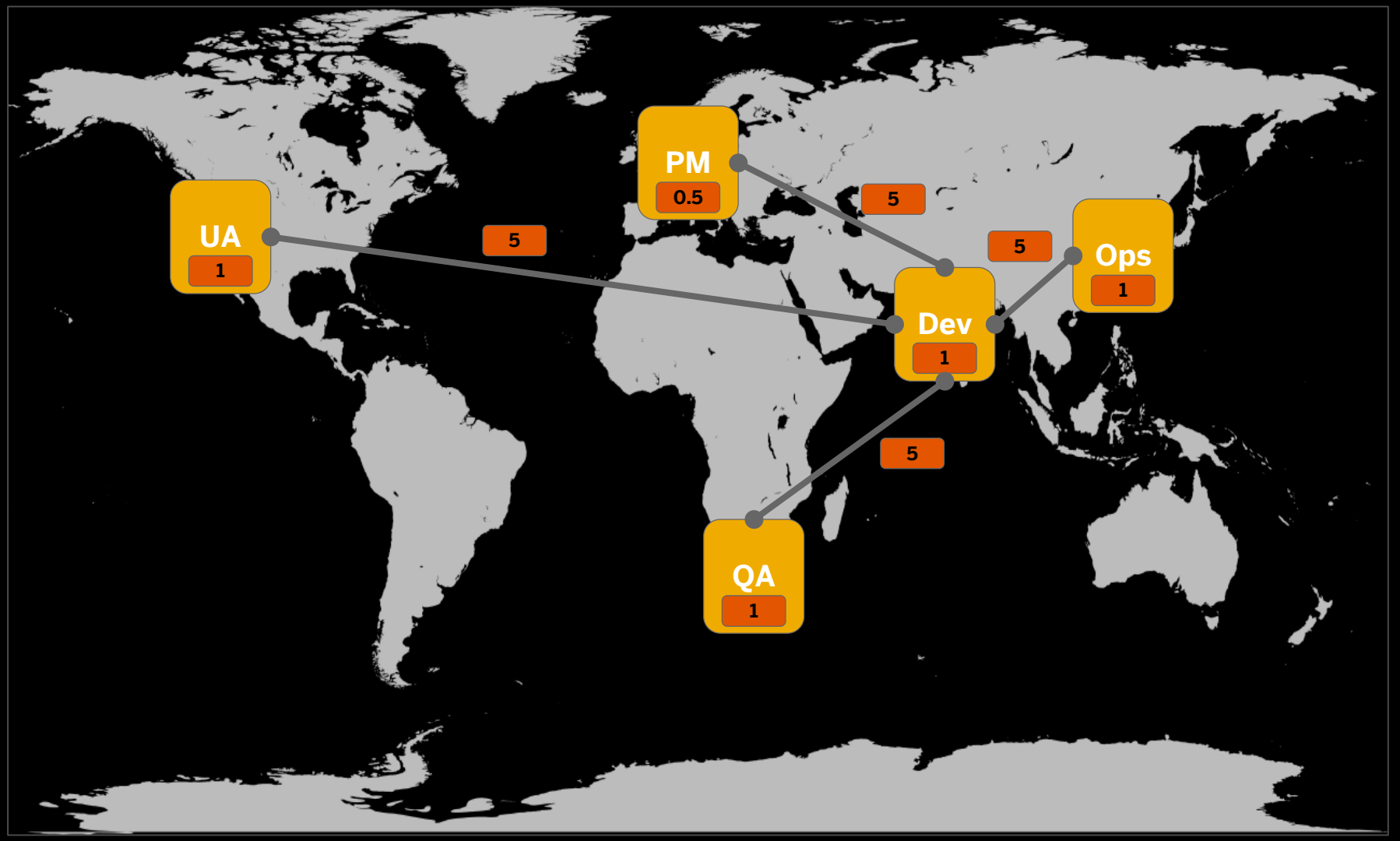

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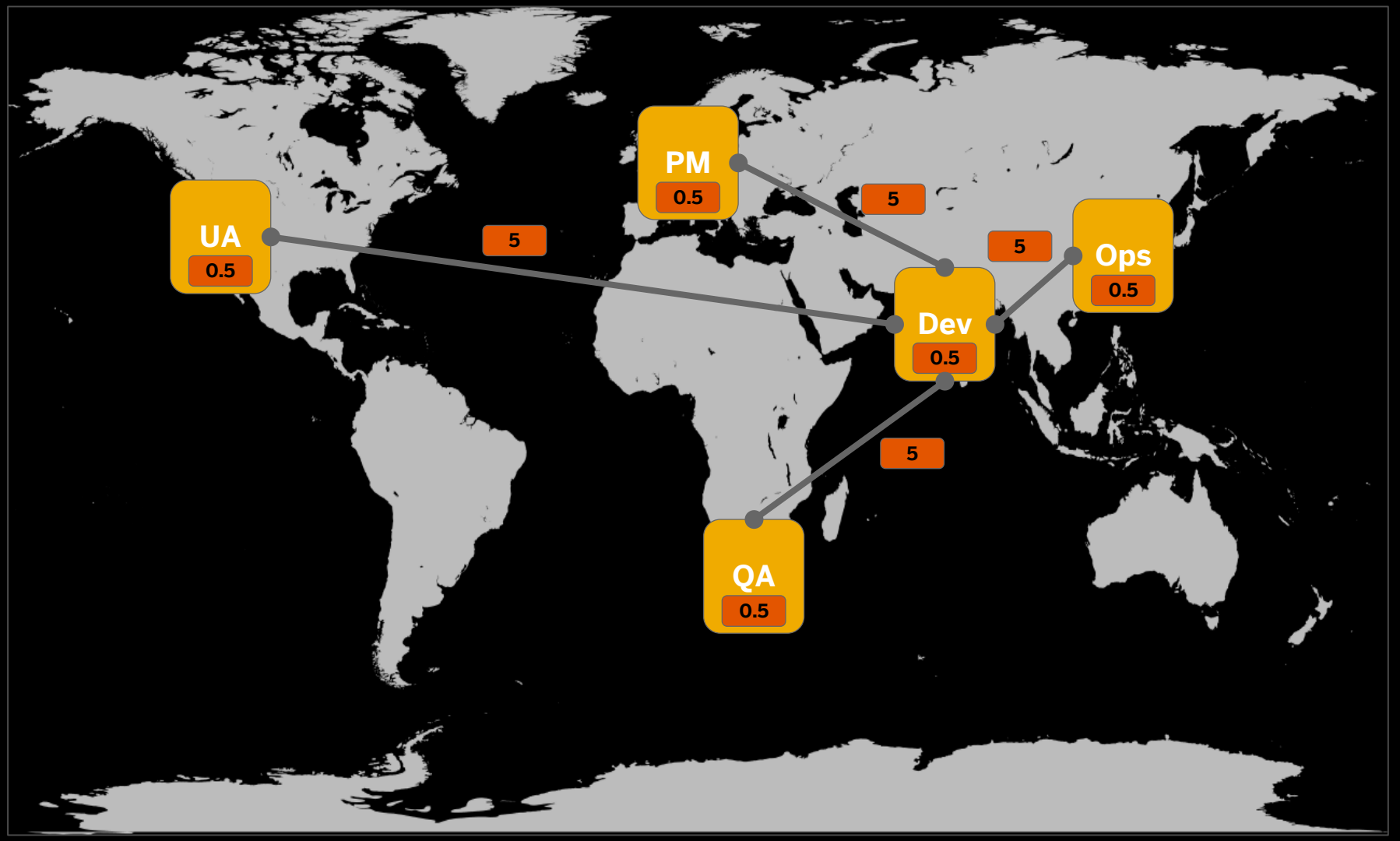

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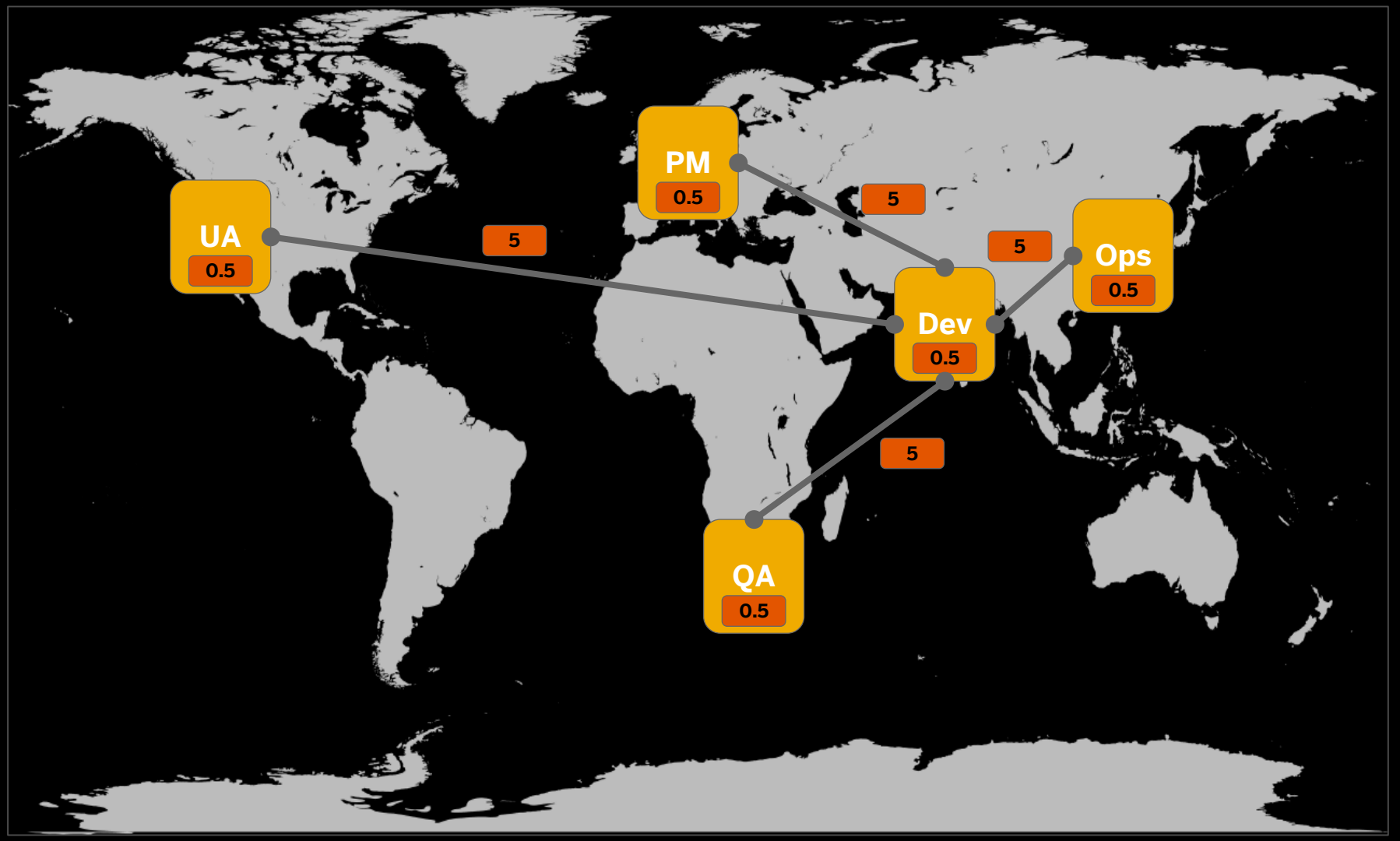

Lead time:

22.5 days

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Tear Down Silos

- **Biggest** problem in most organizations is not in the silos
- **Biggest** problem in most organizations is between the silos

- Create cross-functional, autonomous teams
  - All people with a direct impact on the product should work in one team
  - Keep teams small -> Trust is the foundation of DevOps
- Functional silos only make sense in not direct product related tasks
  - E.g. HR, Legal, ...

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In Other Words…

"DevOps: A culture where people, regardless of title or background, work together to imagine, develop, deploy and operate a system."

Ken Mugrage, Thoughtworks

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C ulture

A utomation

L ean

M easurment

S haring

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From:	To:
• Functional Silos	➡ Cross-functional teams
• Heteronomy	➡ Autonomy
• Avoid Risk and Failure	➡ Failing as Learning Opportunity
• Never Revise Policy	➡ Continuous Process Review

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C ulture

A utomation

L ean

M easurment

S haring

- **Infrastructure-as-Code**
- **Configuration-as-Code**
- **Everything-as-Code**
- **Testing**
- **Creates Consistency**
- **Avoid Repetitive Tasks**
- **Fast**
- **Cattles over Pets**
- **Shares and documents Knowledge**

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S haring

- **System thinking**
- **Always focus on the customer**
- **Fail early, fail often**
- **Eliminate Waste**
- **Continuous Improvement**

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M easurment

S haring

- **“You can only improve what you can measure”**
- **Builds Confidence**
- **Identifies Bottlenecks**
- **Measure and use result as input for next improvement cycle**
- **Hypothesis Driven Development**

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- Share Resources (a.k.a. Cloud Computing)
- Share Responsibility
- Share Success
- Share Knowledge
- Within Team
- Between Teams
- Between Companies

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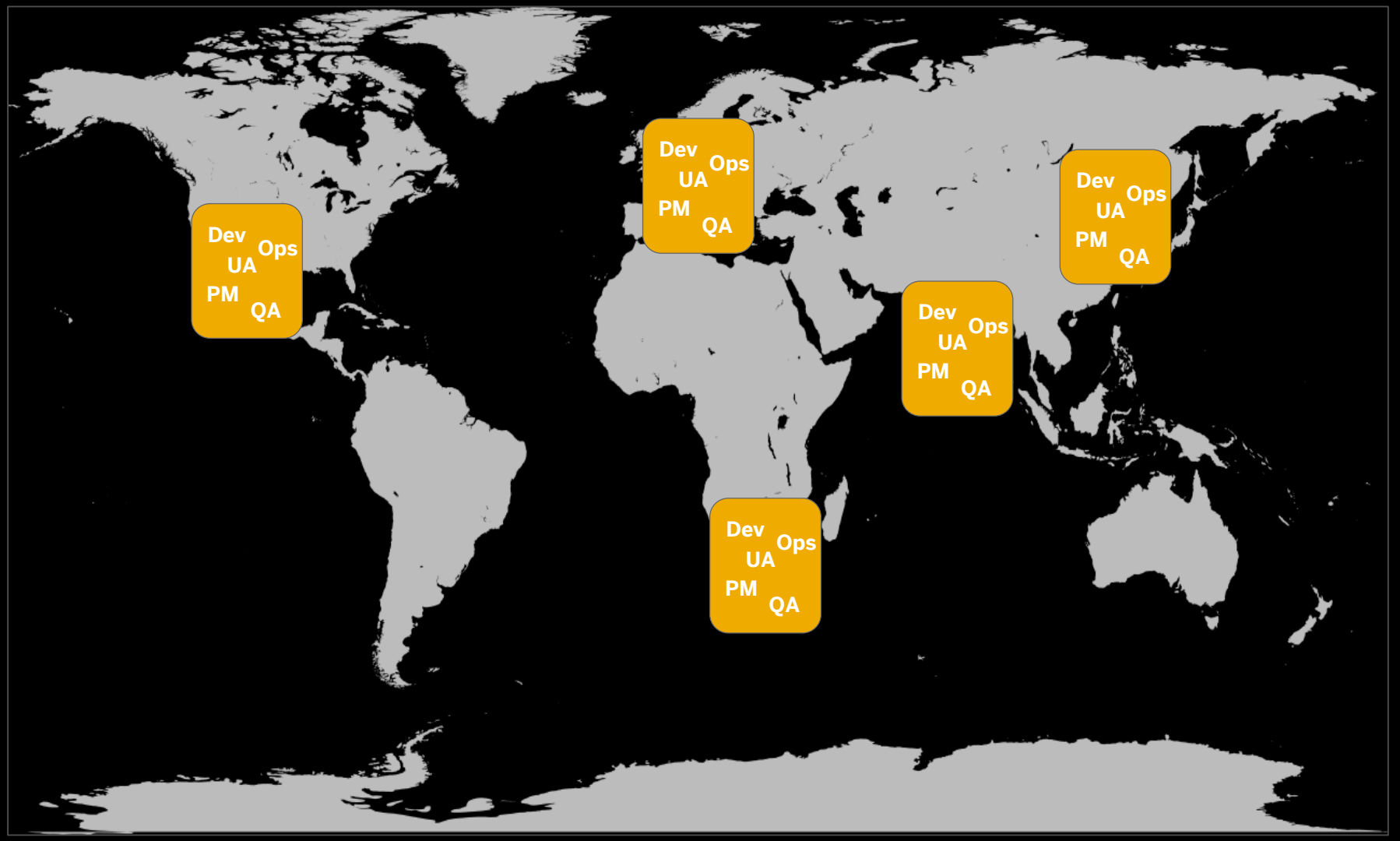
Agile Organization Setup



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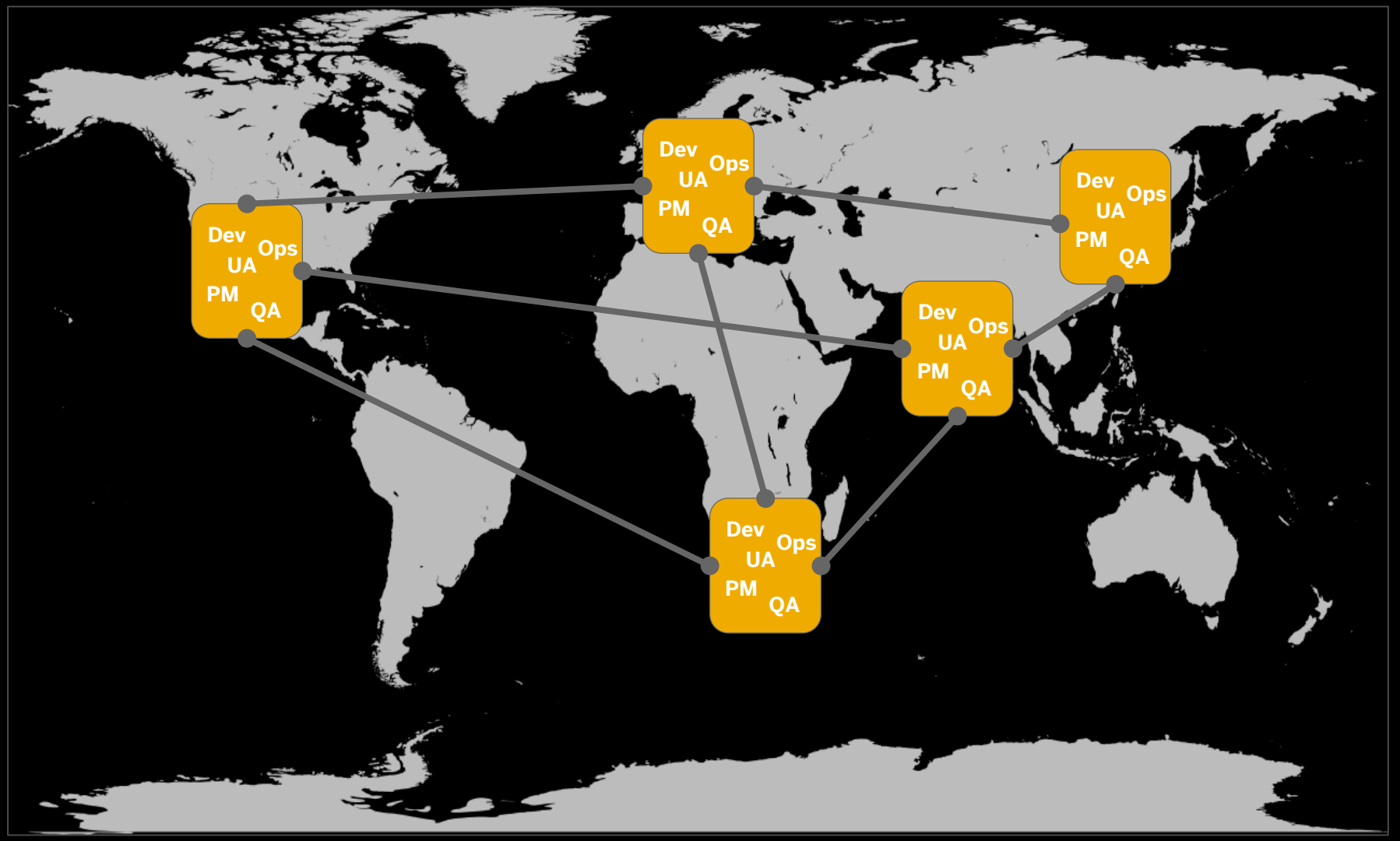
Agile Organization Setup



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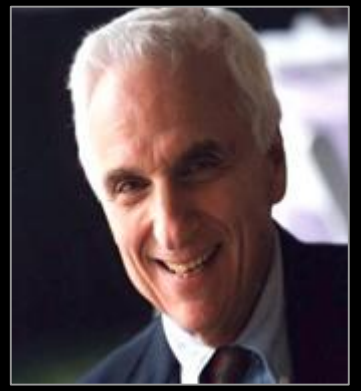
Conway's Law

"Organizations which design systems […]
are constrained to produce designs
which are copies of the
communication structures of these organizations."



Melvin Conway
Computer scientist

- **Architectures are constrained to organizations communication structures**
- **In doubt, communication structures overrule architecture…**

"Culture eats strategy for breakfast"
Peter Drucker

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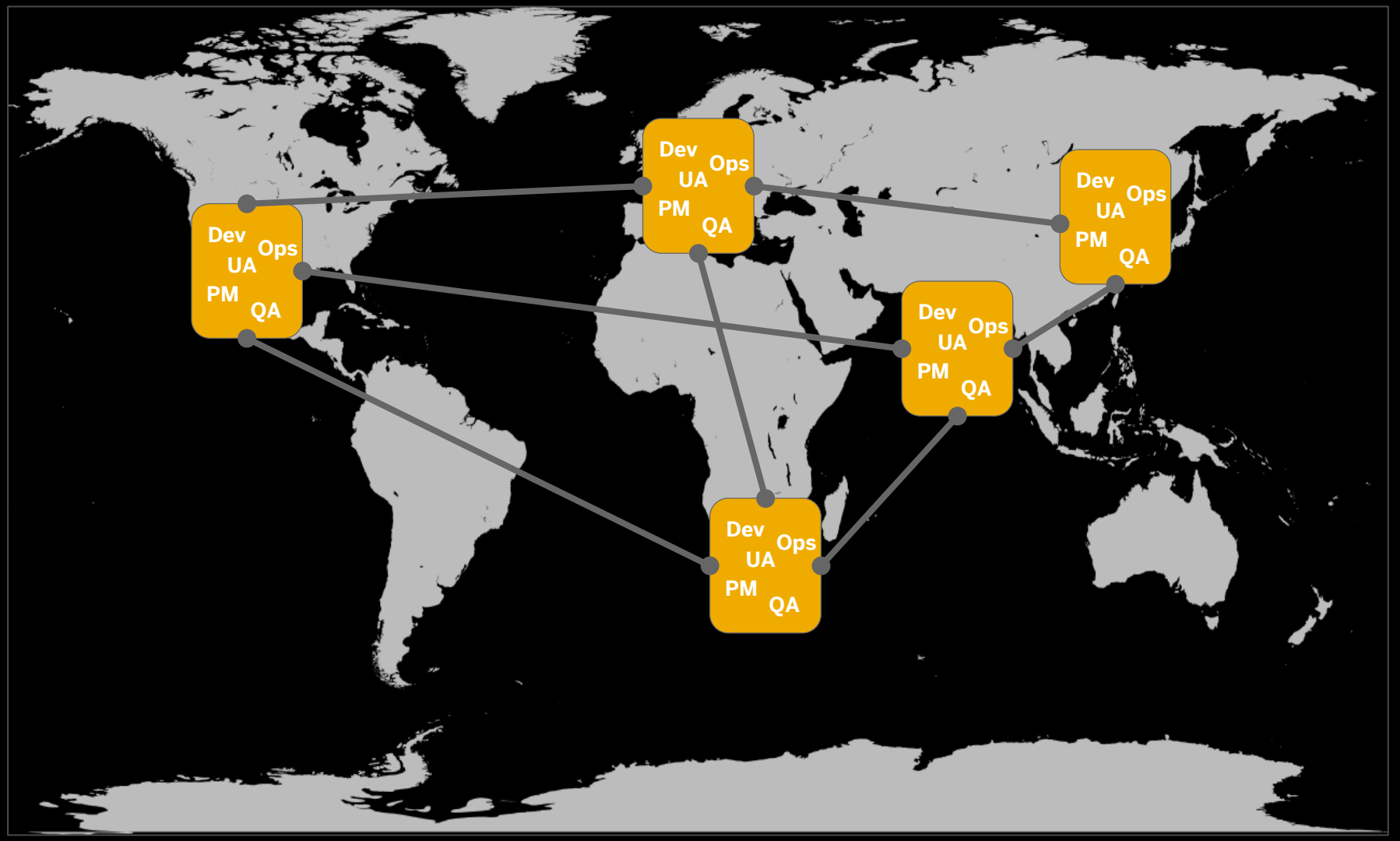
Conway’s Law - Reversed



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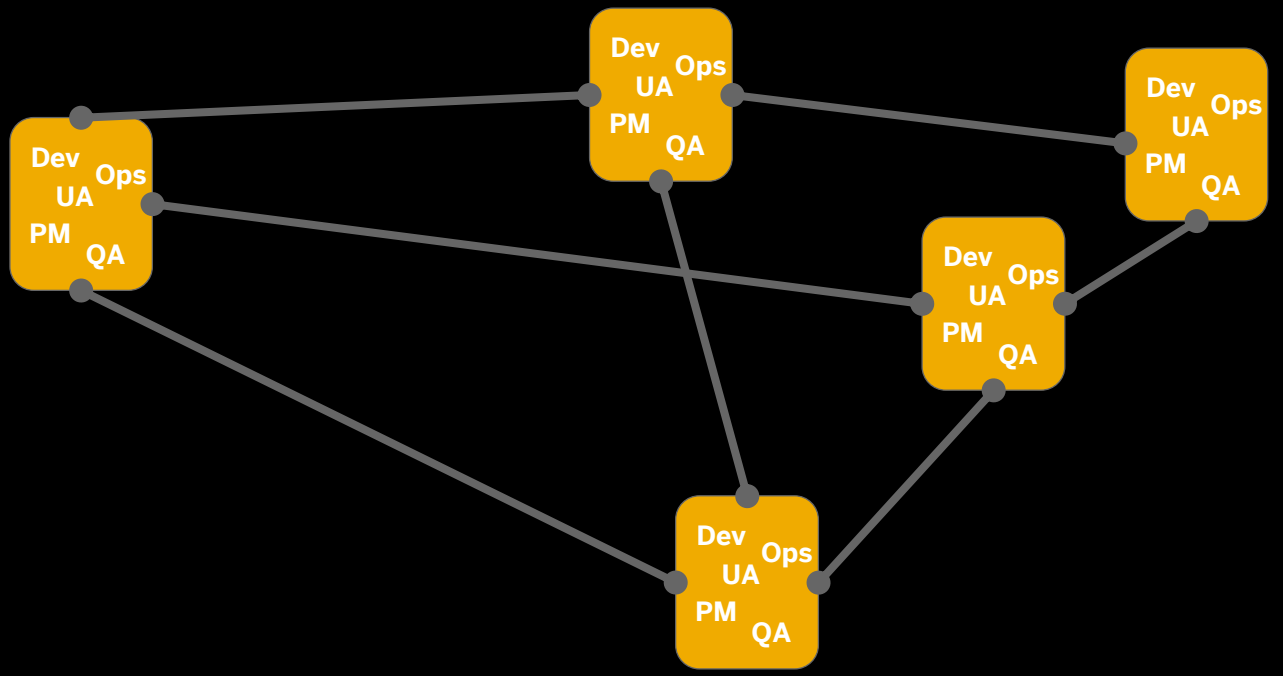
From Organization Setup…



- **Setup your organization**

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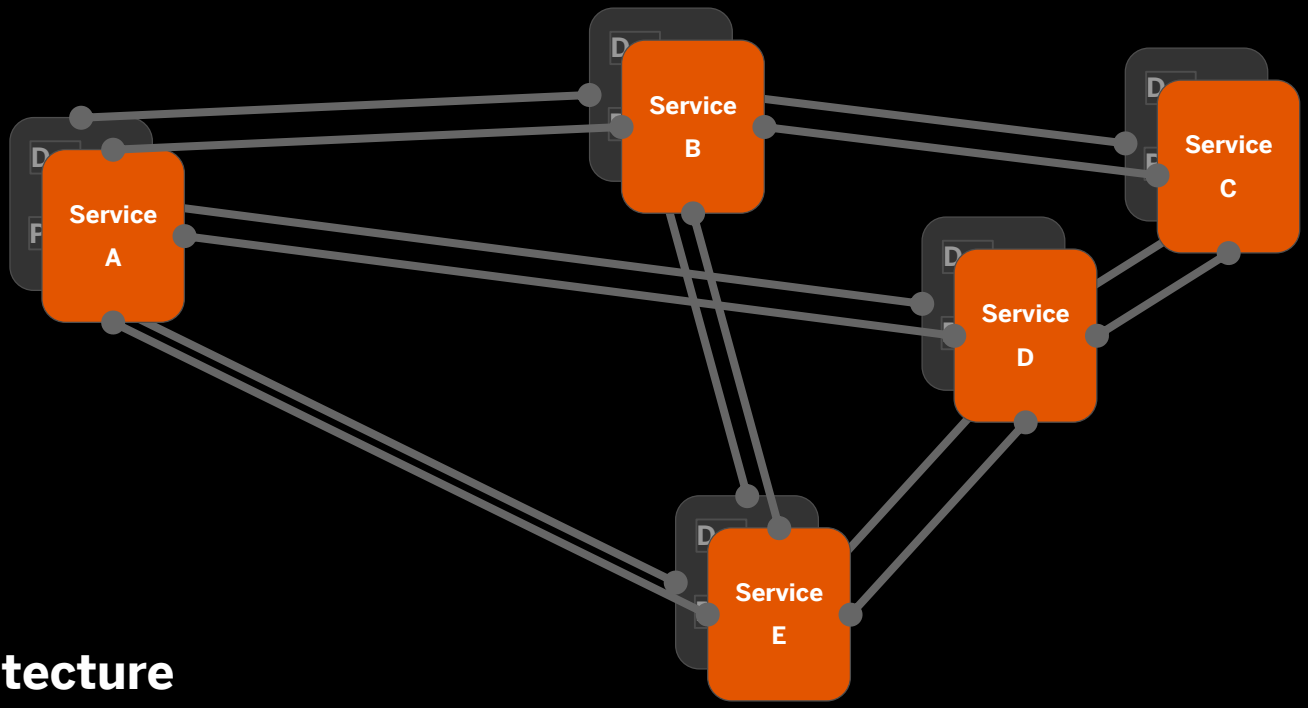
From Organization Setup…to microservice architecture…



- **Setup your organization in alignment to your architecture**

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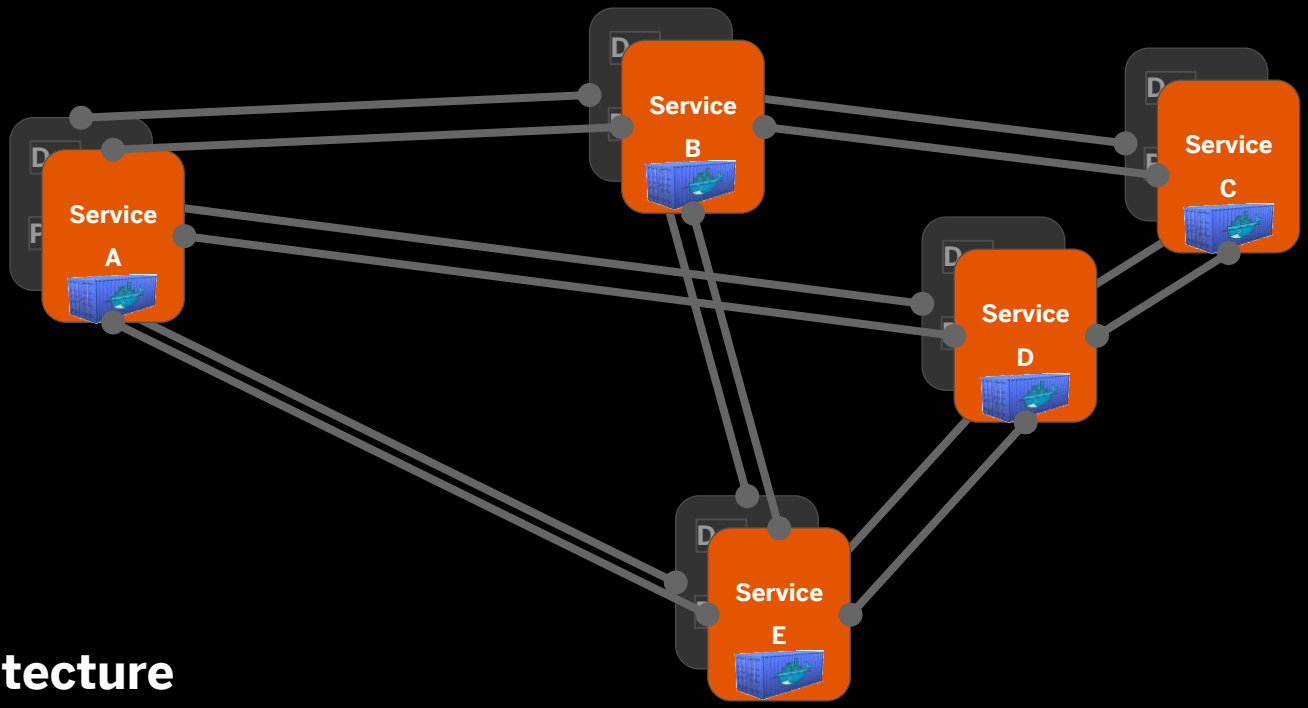
From Organization Setup…to microservice architecture…to containers



- **Setup your organization in alignment to your architecture and leverage containers as fast, reproducible, encapsulated runtimes**

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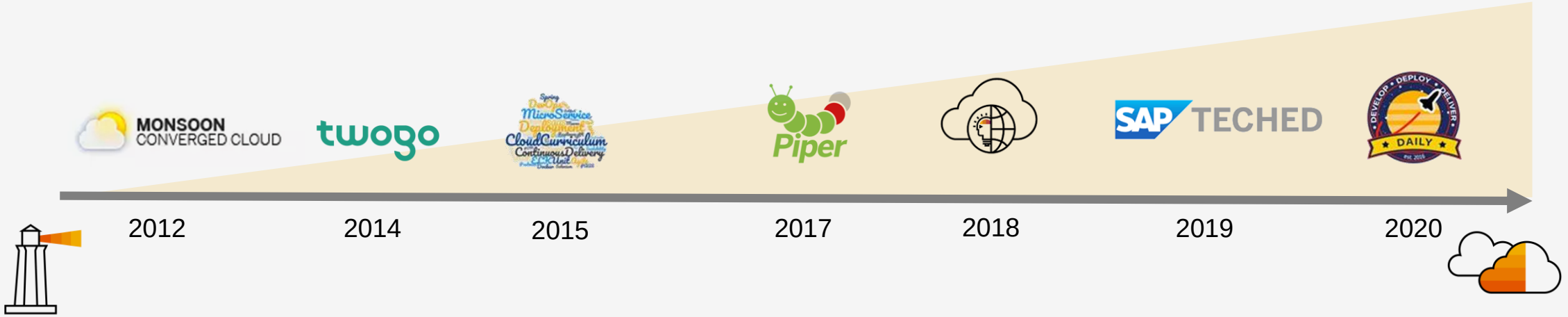
DevOps@SAP

From Lighthouse projects to Cloud Core DNA



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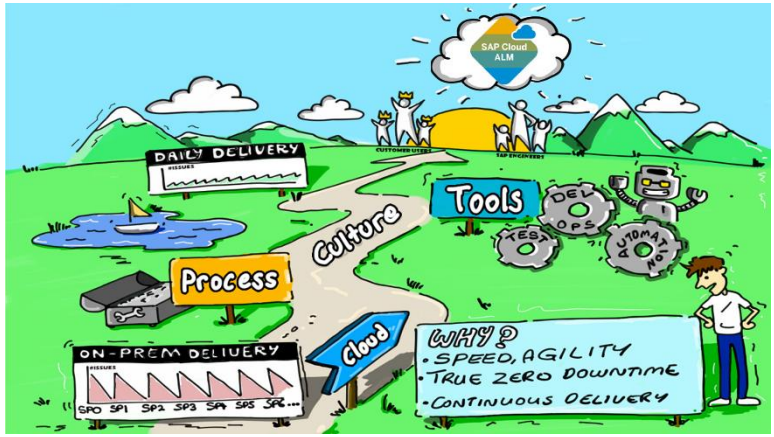

Deploy with Confidence (DwC)

Culture, Process, Tools, Real Life Example

October 2020

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Storage Location

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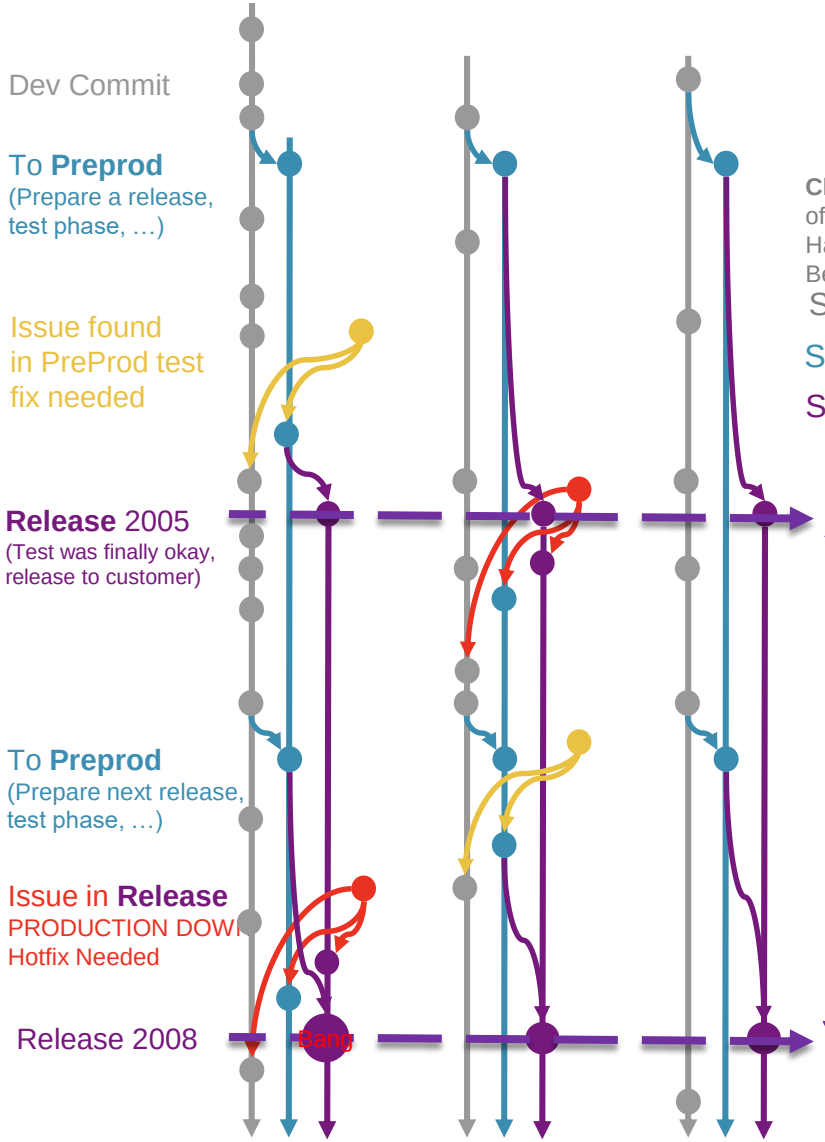
Deliver Mesh of 3 Microservices

Traditional Way at SAP (Multi-Branch, Deployment = Release)

200 Developer Organization, transformed to Cloud **Engineering** in 9 month, by…

Branches: **Master** **Preprod** **Release** **FIX** **Hotfix**



Challenge 2: Explosion of combinations of services and branch-versions that integrate. Have these combos been tested???
Below just example with 2 services, 3 Branches

Service 1 → Service 2
Service 1 → Service 2
Service 1 → Service 2

Often > 14 Weeks between releases

Challenge 3: How frequent can deliveries be done here? Considering the copies, rebuilds, test phases.

Challenge 4: How often has the big release integration caused a big bang at customer? How long did it take for Dev team to solve issue that have been developed months back?

Challenge 5: How long does it take to follow the exceptional hotfix process that is usually not tested?

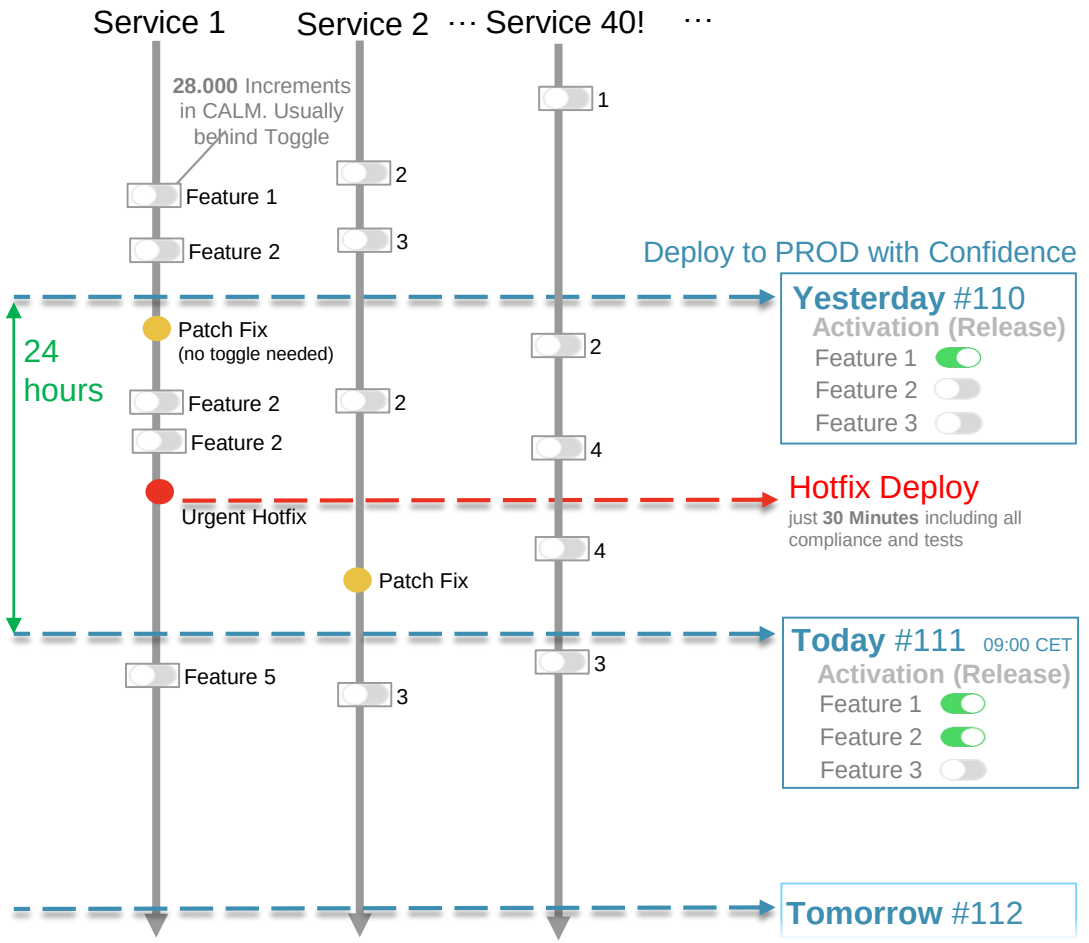
Challenge 6: **Stress** and peak load for our engineers.

Challenge 1: Complexity in Branch and Patch management
- You will only see when you are live! Then it is too late

Deploy with Confidence

Process and Culture

Branches: **Master**



Single Trunk

✓

Simplification, Flexibility (by toggle)

Delivery to Prod

Daily

Agility, Automation, Quality

Cloud Engineering Process - Deploy with Confidence

Delivering SaaS Apps at Scale, Daily

Customer Requirements → **Plan** → **Code** → **Build** → **Test** → **Deploy** → **Release** Progressive Feature Activation → **Operate, Observe and automate**

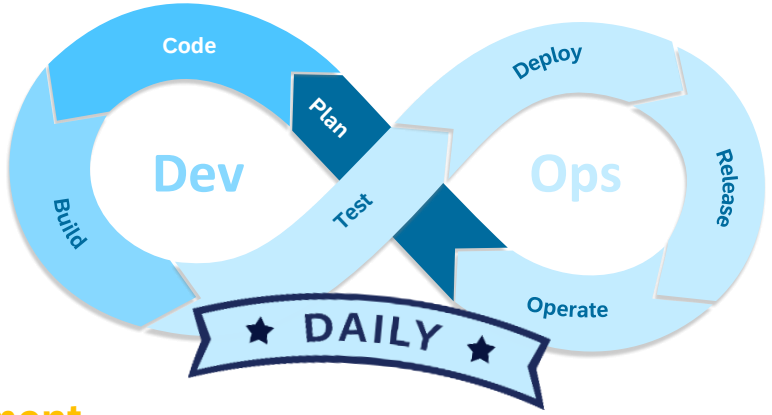
Define feature
including DoDs
feature needs to fulfill before it gets released

Development
behind release-feature **toggle**

Single Trunk

Fast component **build pipeline**
with lead time <15 min.
Compliancy!

Fully automated **end to end tests** for every single feature from **customer perspective**



Deployment
!= Release

Release = activate feature
strict fulfillment of DoDs

Zero downtime activation
without interrupting existing user sessions

Progressively

Measure feature usage/**success**

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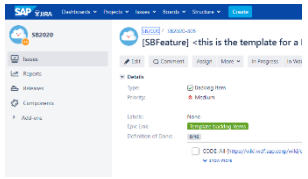
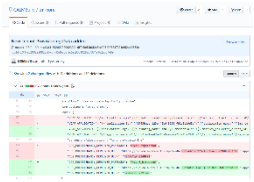
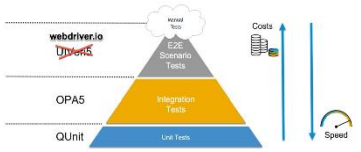
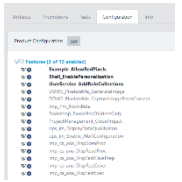
Cloud Engineering Tools - Deploy with Confidence

Golden Path of Tools to deliver SaaS Apps at Scale, Daily

Legend: Golden Path, Free Breakout, Open Source/Commercial off the shelf, SAP proprietary tools

Customer Requirements	Plan	Code	Build	Test	Deploy	Release	Operate, Observe and automate
							
	Jira GitHub	CAP Spring Boot Node.js	Jenkins Piper	Azure DevOps SauceLabs webdriverIO Nightwatch.js	MTA CF PUSH Docker	SlackBot MS-Teams HANA Postgres WebAssist	ELK Dynatrace Sentry

Often several tools can be used to *live* the process.
Tools have individual pro/cons. People have choice here and are enabled to optimize for all (inner-source)

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Comparing Software Delivery Performance - DORA

Aspect of Software Delivery Performance*	Elite	High	Medium	Low
Deployment frequency For the primary application or service you work on, how often does your organization deploy code to production or release it to end users?	On-demand (multiple deploys per day)	Between once per day and once per week	Between once per week and once per month	Between once per month and once every six months
Lead time for changes For the primary application or service you work on, what is your lead time for changes (i.e., how long does it take to go from code committed to code successfully running in production)?	Less than one day	Between one day and one week	Between one week and one month	Between one month and six months
Time to restore service For the primary application or service you work on, how long does it generally take to restore service when a service incident or a defect that impacts users occurs (e.g., unplanned outage or service impairment)?	Less than one hour	Less than one day[a]	Less than one day[a]	Between one week and one month
Change failure rate For the primary application or service you work on, what percentage of changes to production or released to users result in degraded service (e.g., lead to service impairment or service outage) and subsequently require remediation (e.g., require a hotfix, rollback, fix forward, patch)?	0-15%[b,c]	0-15%[b,d]	0-15%[c,d]	46-60%

* The KPIs define how to measure DevOps capabilities and have been defined in a large study called DORA State of DevOps

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Key Take-Aways

Deploy with Confidence (DwC) is a SAP-Internal, proven combination of

- Culture
- Processes
- Tools

for daily delivery to production. – With Confidence!

SAP Cloud ALM, Live.

From monolithic development to daily delivery!
200 Engineers, 9 months,

- ✓ We deliver Daily.
- ✓ We improve Daily Automation, Co-innovations, Inner-Source, …
- ✓ We get **faster** every day!

SAP ALM Summit 2020 – Topic 2020-10-09

	Track 3 - Cloud Technologies for ALM professionals
09:30 - 10:15	Introduction to cloud technologies
10:25 - 11:10	Workflow with SAP Cloud Platform
11:20 - 12:10	Introduction to extensions for SAP Cloud Platform with Cloud Foundry, Cloud SDK and SAP API Business Hub

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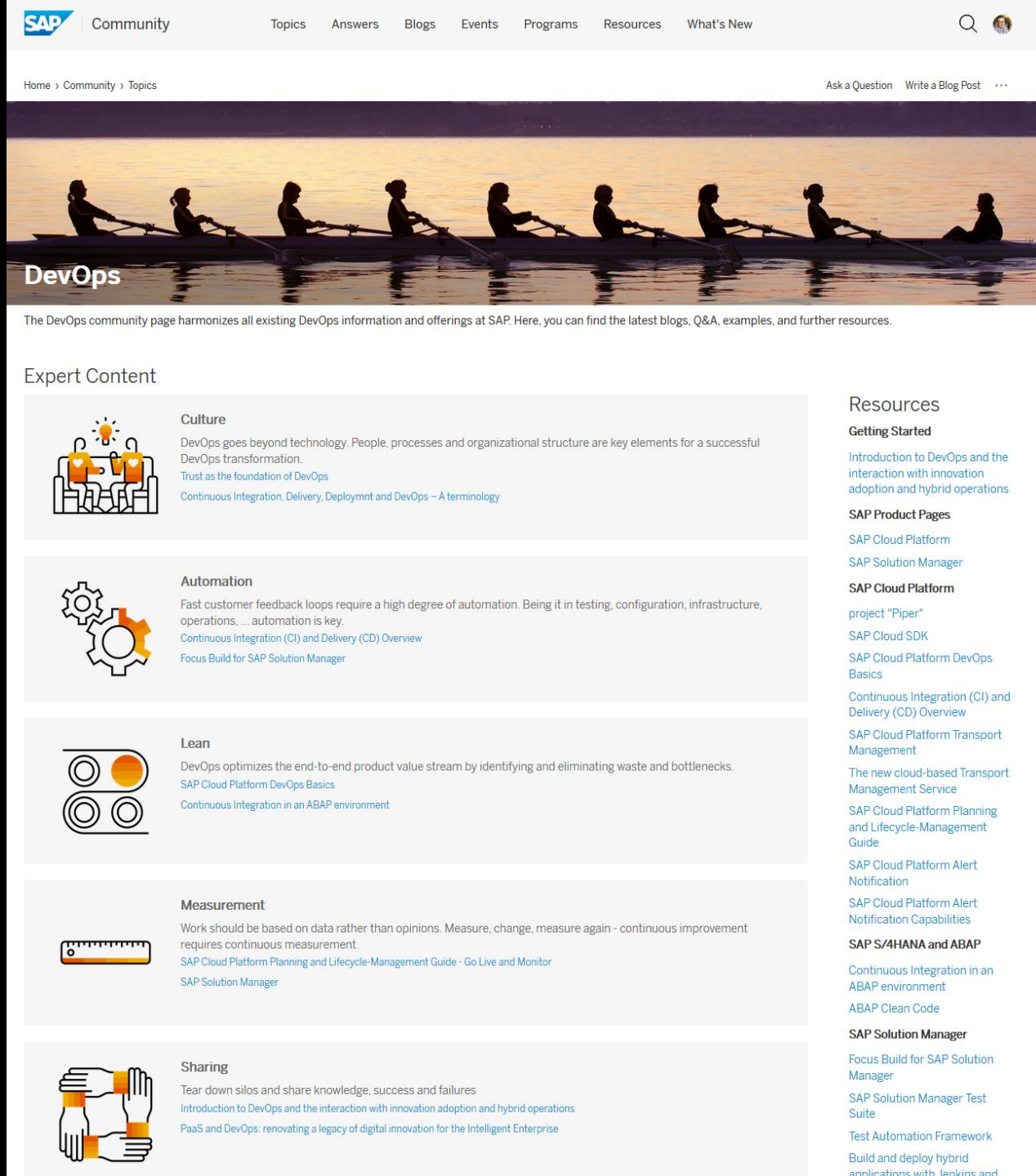
DevOps Community Topic Page

- One entry page for DevOps with SAP
- Launched Sep/2019
- Community for and by SAP, Customers and Partners



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DevOps with SAP
Vision

“Apply DevOps principles to customer’s SAP technology stack (and beyond).

Along the CALMS pattern, we’ll provide tools, libraries, best-practices, trainings, services and knowledge exchange.”

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DevOps in a Nutshell

October 8, 2020
3 PM – 4:30 PM, CET (Germany)

Speakers:
Dirk Lehmann,
DevOps evangelist and Continuous Delivery expert, SAP

Andreas Löbel,
Chief Development Architect for SAP

DevOps in an ABAP-based environment

October 15, 2020
3PM - 4:30 PM, CET (Germany)

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Speaker:
Karin Spiegel,
Product Management team member for Cloud and Lifecycle Management, SAP SE

Efficient DevOps with SAP Cloud Platform

- **October 22, 2020**
- **3PM - 4:30 PM, CET (Germany)**

- Speaker:
- **Boris Zarske,**
- Product Manager for Cloud & Lifecycle area, SAP SE

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Thank you.

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