

COMP.SE.140 – 2nd session

Course topics

Are you on the right course?

- Passed Web Programming 2: Maybe
- Otherwise:
 - MSc major Software Engineering or Software Web&Cloud
 - First year student: **NO**
 - Otherwise: Maybe
 - Some other major
 - With working experience on Web and Cloud Software development: Maybe
 - Otherwise: NO
 - Still without bachelor degree (Sisu still show that you do MSc): **NO**
- Your major is in data science, security, signal processing and with course you want to increase employability: I see your point, **but NO.** Contact me if you are interested in alternatives



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Discussion session

Homeworks

05.09: Discussion about DevOps (Tue 05.09 at 1015 in TB207, Tietotalo)

- To prepare: watch

<https://tuni.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=4b7b047e-1b85-4e53-89f8-ad9400924252> and read 2.1 and 2.2 from

<http://jultika.oulu.fi/files/isbn9789526217116.pdf>

At the event we will discuss these and cover some new material

What is DevOps?

- What are the background motivations?
- Definition of DevOps

What is DevOps (there are several definitions)

- Lucy Lwakatare:
 - DevOps is a concept that embodies a **cultural and mindset change** that is substantiated with a **set of practices** to encourage **cross-disciplinary collaboration between software development and IT operations** within a software company. The main purpose for the collaboration is to enable the **fast release of quality software changes** while simultaneously **operating resilient systems**.
 - From a **socio-technical perspective**, DevOps practices are focused on the **automation practices** of software deployment and infrastructure management, specifically automation of configuration management and monitoring.

What is DevOps?

- Benefits of DevOps?

- improvement in speed (release cycle time)
- continuous deployment of system changes
- productivity of operations work
- improved morale, knowledge and skills

- Challenges of DevOps?

- **resource constraints;**
- **insufficiencies in infrastructure management;**
- **high demands for required skills and knowledge, and**
- **difficulties in monitoring microservices**

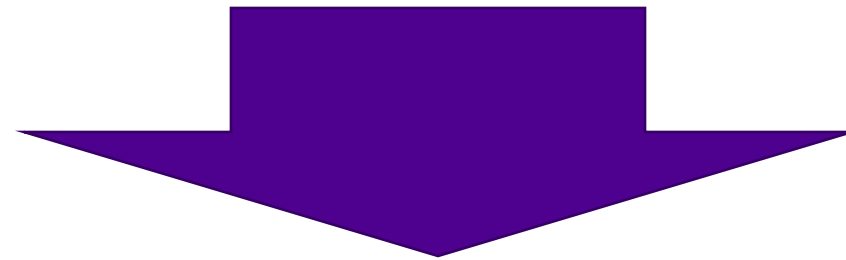
These are a bit
challenged today

Business

Development

Operation

Use



Business

Development

Operation

Use



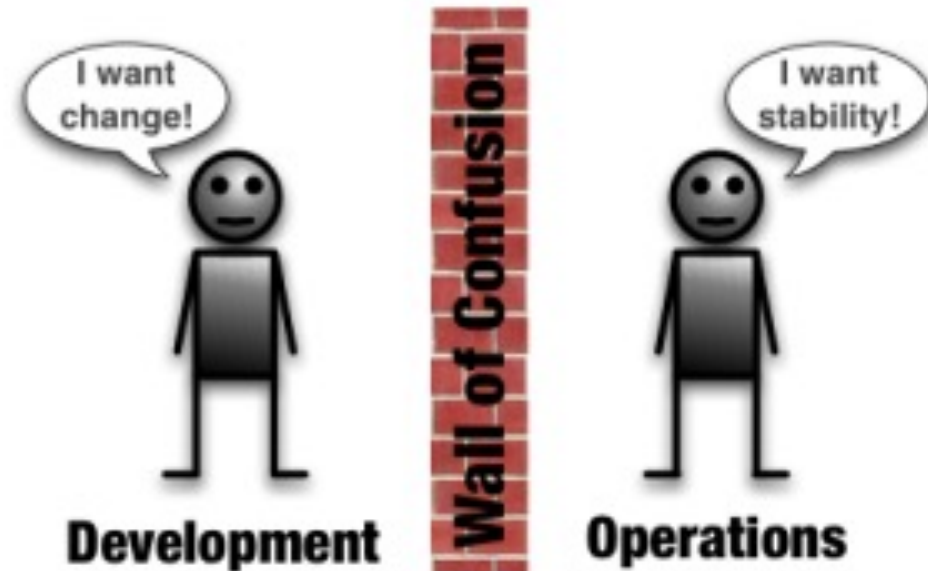
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Platform engineering

DevOps – where it started

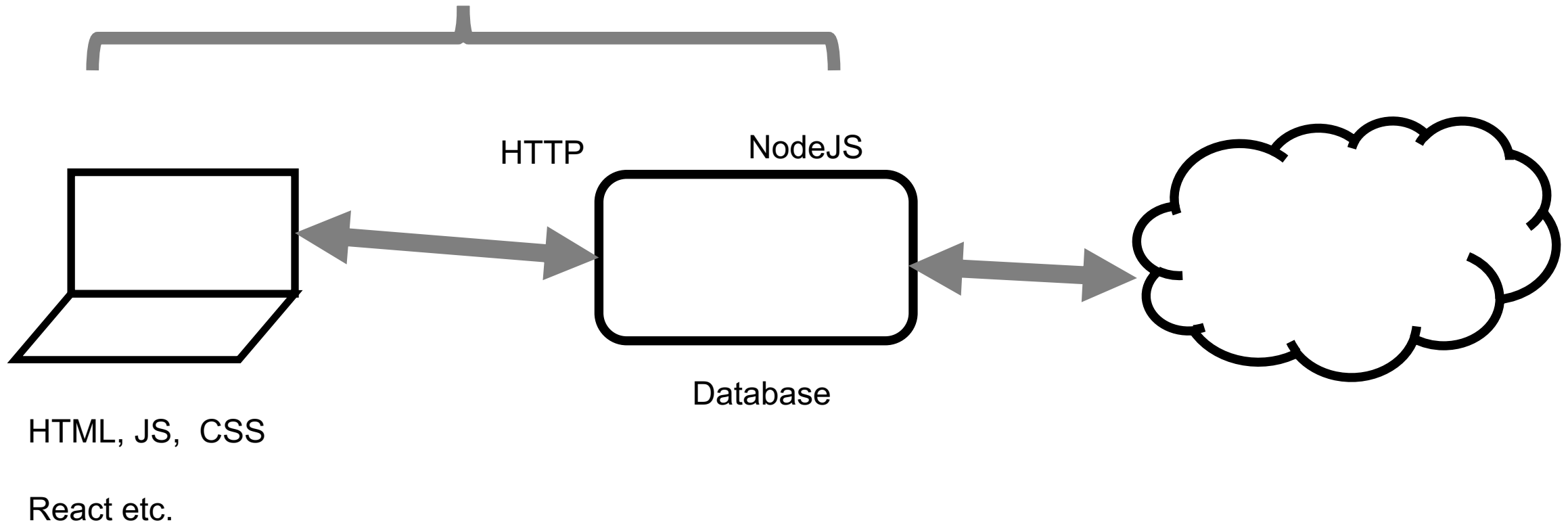
(<http://dev2ops.org/2010/02/what-is-devops/>)

- DevOps is a response to the growing awareness that there is a disconnect between what is traditionally considered development activity and what is traditionally considered operations activity. This disconnect often manifests itself as conflict and inefficiency.
- Wall of confusion

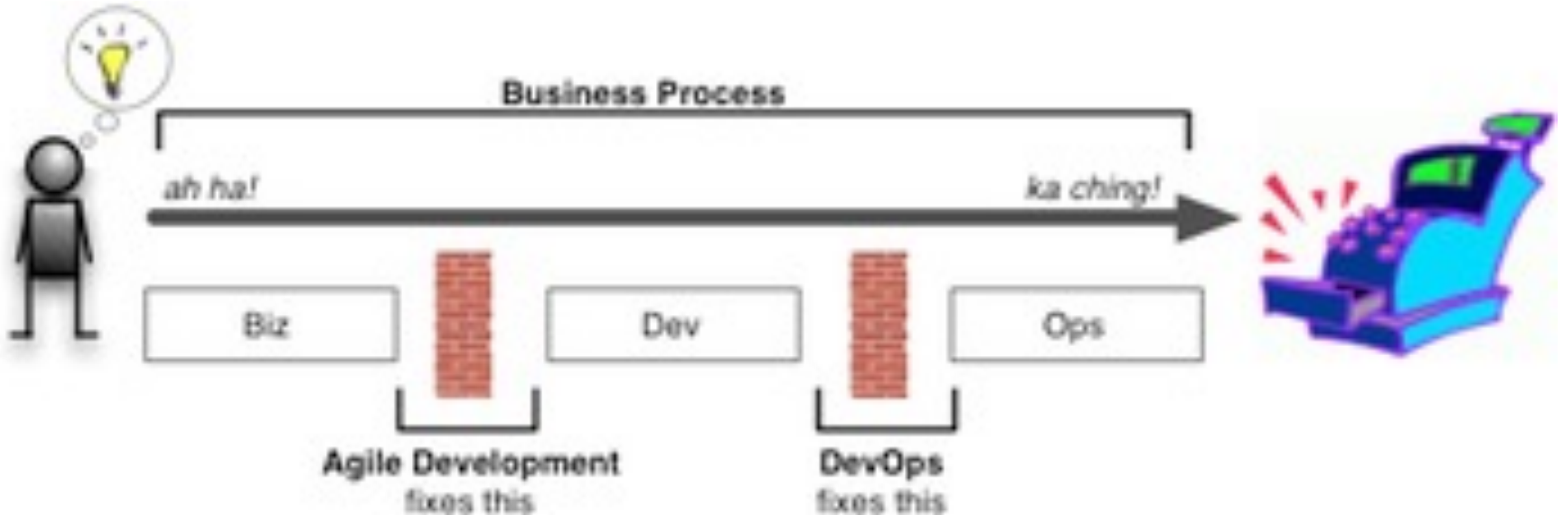


Full stack development

Distributed end to end application



The lifecycle



Related reading

Full Stack is Not What It Used to Be

Antero Taivalsaari^{1,4}, Tommi Mikkonen², Cesare Pautasso³, Kari Systä⁴

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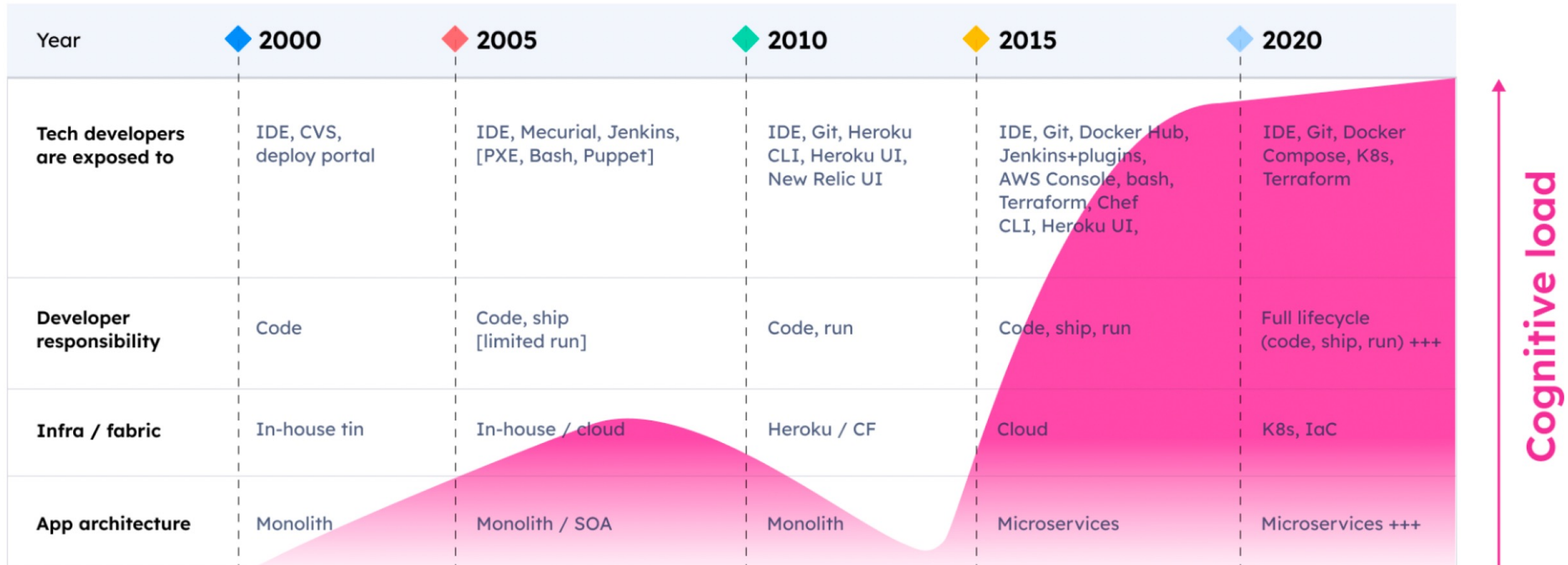
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Download: <https://helda.helsinki.fi/items/47b6de91-ad0b-4bd4-9e40-ac2b5c61a040>

From: State of Platform Engineering Report Humanitec, inc

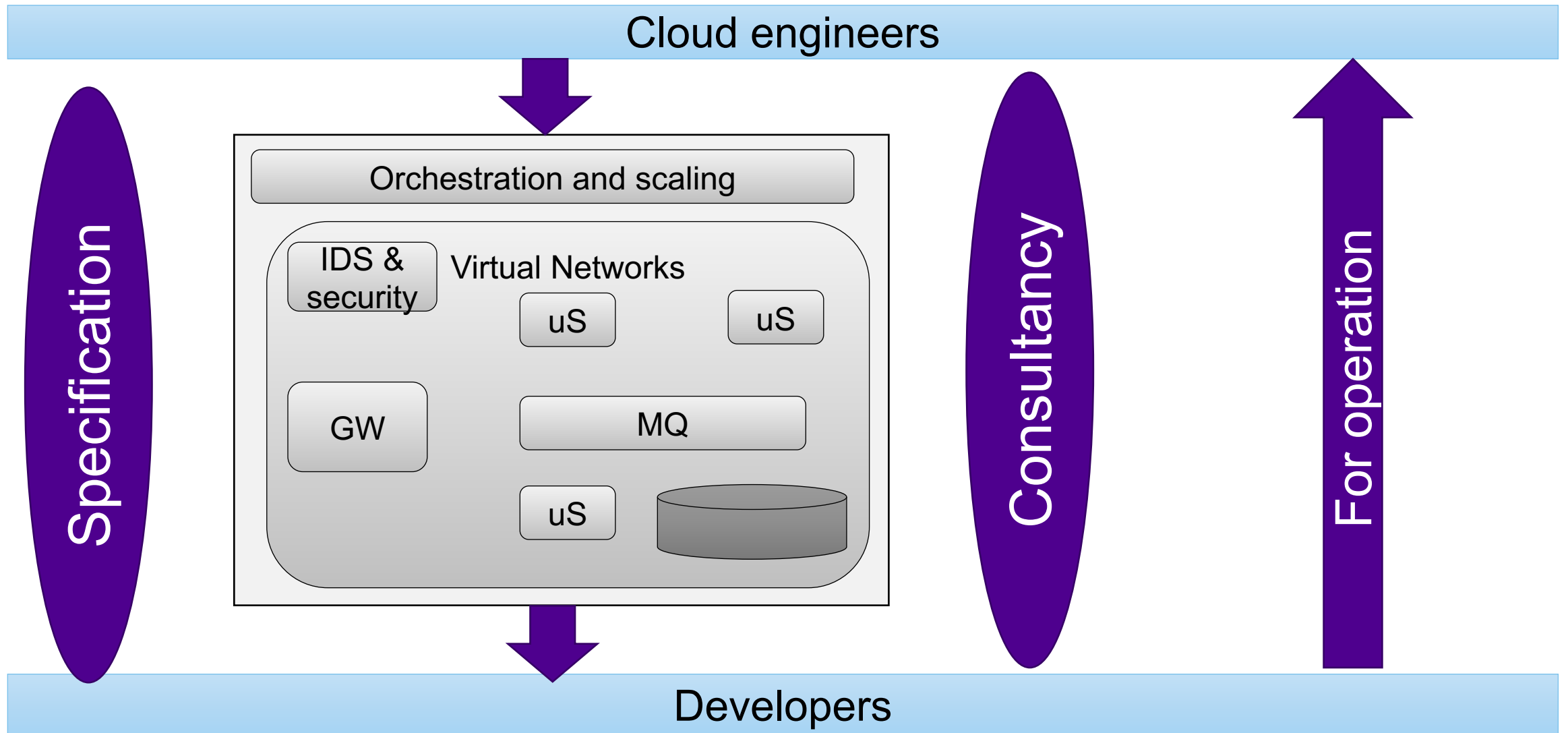


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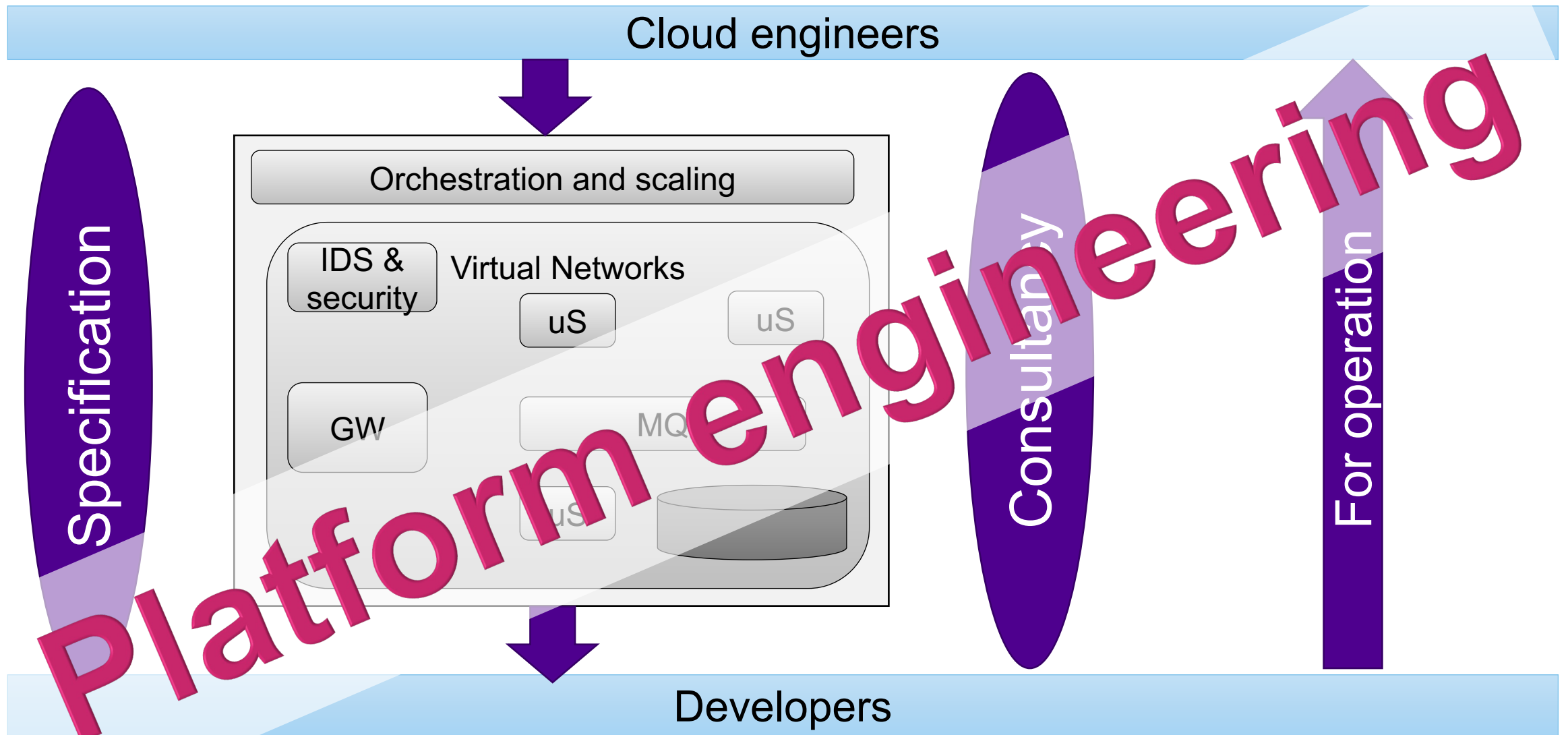
DevOps
burn out



Split of work

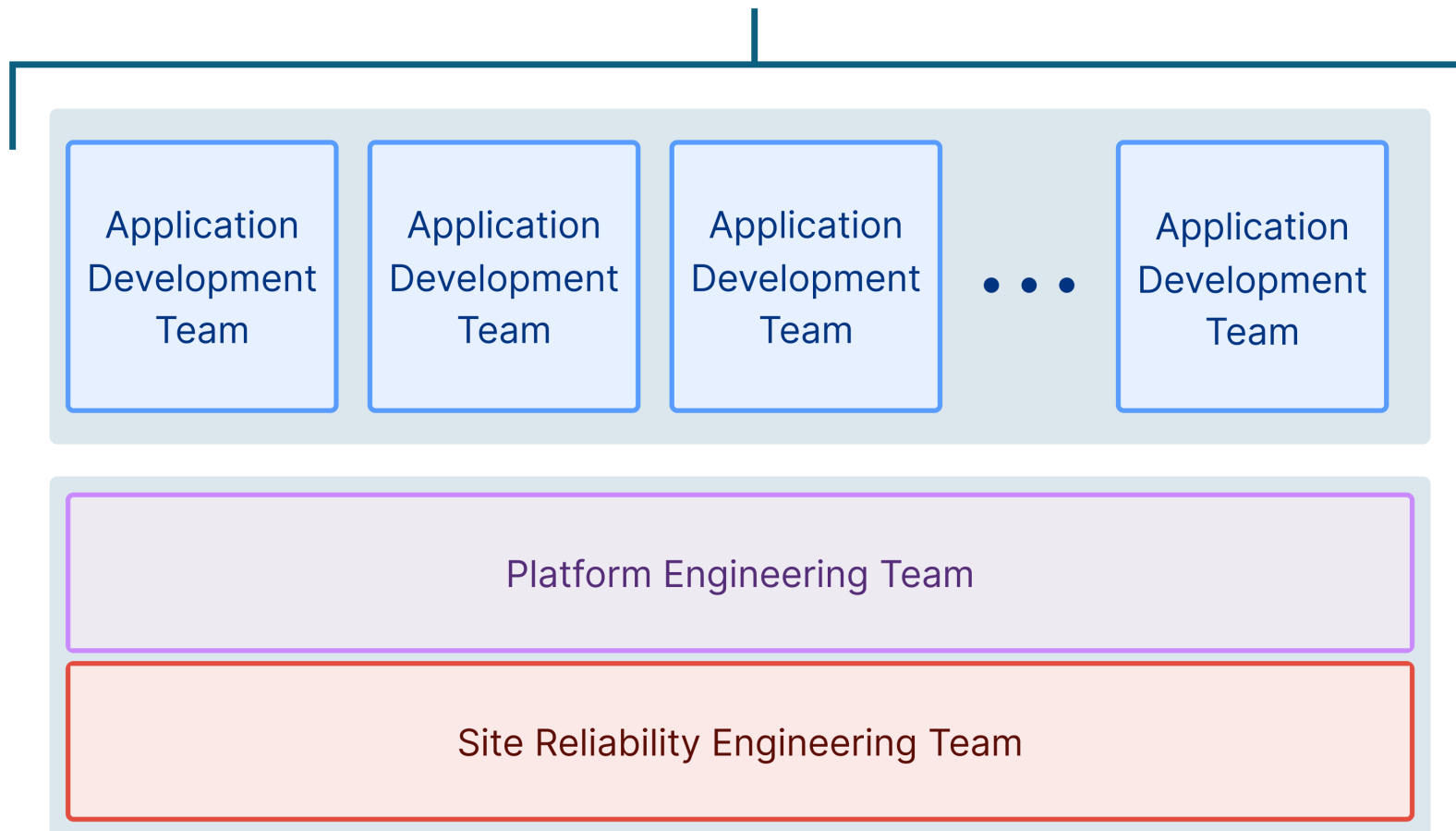


Split of work

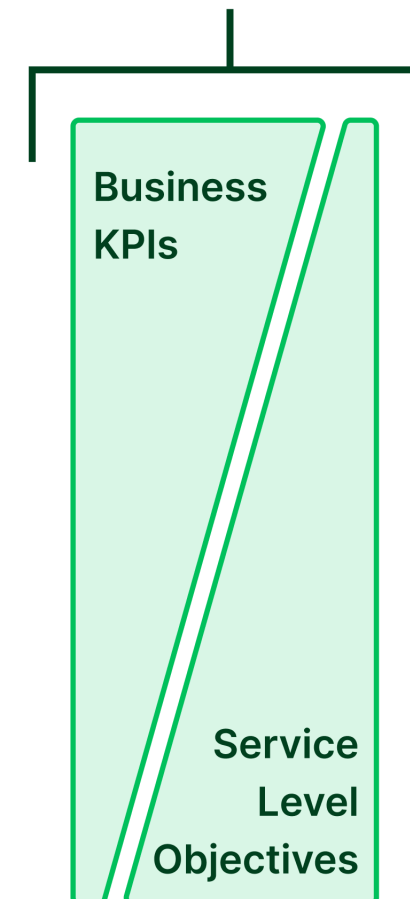


<https://www.getambassador.io/resources/rise-of-cloud-native-engineering-organizations>

How Teams are Organized



How Teams Measure Success



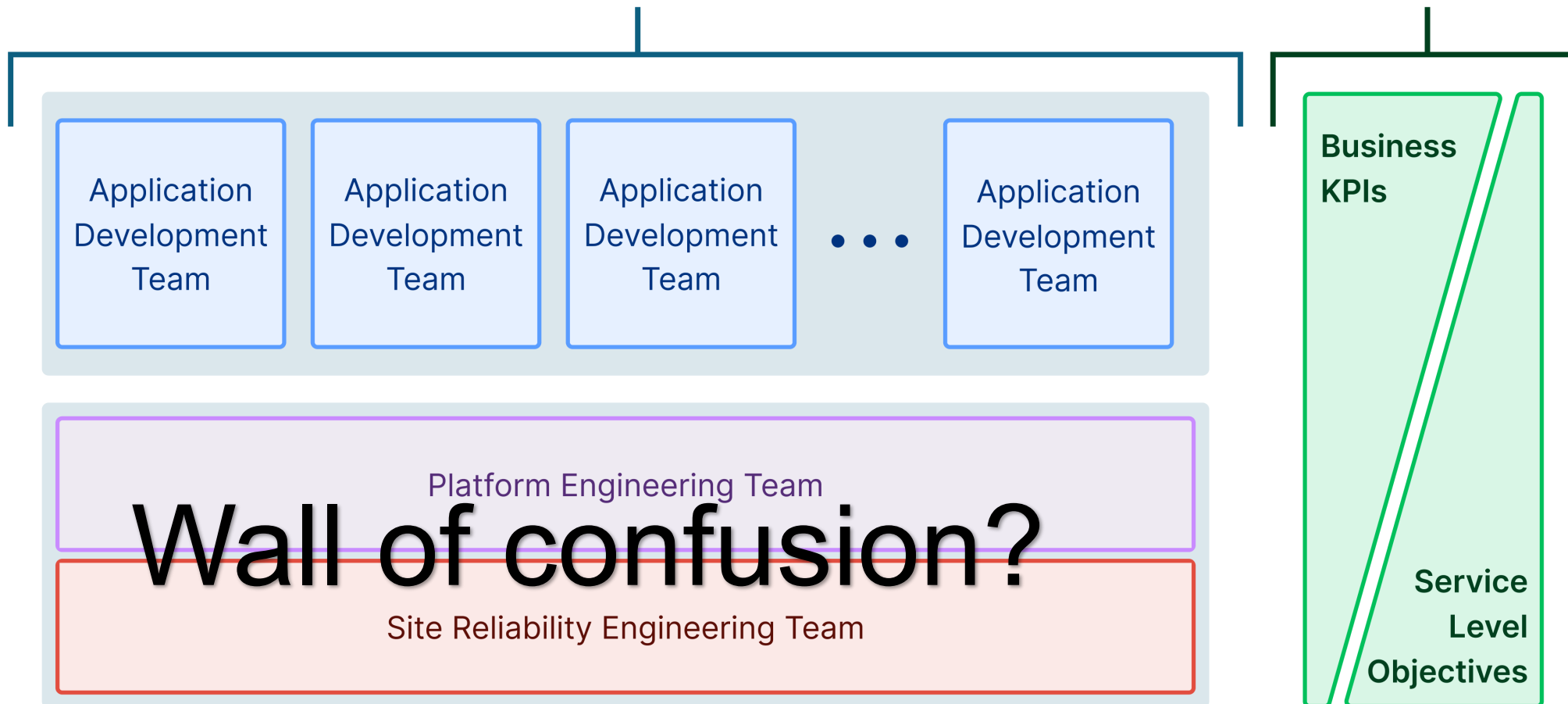
Principles

- Clear mission and role
- Treat your platform as a product
- Focus on common problems
- Glue is valuable
- Don't reinvent the wheel

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How Teams Measure Success

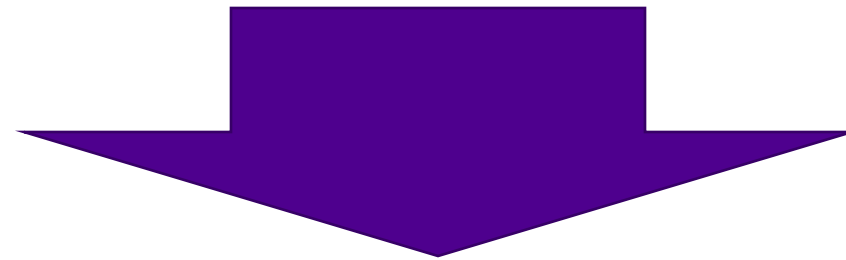


Business

Development

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Use

DevSecOps

Definition

- DevSecOps is seen as a necessary expansion to DevOps, where the purpose is to integrate security controls and processes into the DevOps software development cycle and that it is done by promoting the collaboration between security teams, development teams and operations teams.

- H. Myrbakken, R. Colomo-Palacios, DevSecOps: A Multivocal Literature Review., in: A. Mas, A. Mesquida, R. O'Connor, T. Rout, A. Dorling (eds) Software Process Improvement and Capability Determination. SPICE 2017. Communications in Computer and Information Science, vol 770. Springer, Cham, 2017, pp. 17-20. https://doi.org/10.1007/978-3-319-67383-7_2.

Principles

- Culture: DevSecOps means to include collaboration with the security team as well as promote a culture where operations and development also work on integrating security in their work.
- Automation: DevSecOps promotes a focus on automating security, to be able to keep up with the speed and scale achieved by DevOps. The aim should be 100% automation of security controls, where the controls can be deployed and managed without manual interference.
- Measurement: DevSecOps promotes the use and development of metrics that track threats and vulnerabilities throughout the software development process
- Sharing: DevSecOps promotes the inclusion of the security team in the sharing promoted in a DevOps environment.
- Shift security to the left: This means that security teams are involved from the very first planning step and is part of planning every iteration of the development cycle

Practices

- Threat modeling and risk assessments:
- Continuous testing:
- Monitoring and logging:
- Security as code:
- Red-Team and security drills:

Next week

- Containers and docker
 - Interactive session, reading material provided
- First exercise