CONTINUOUS DELIVERY IN AWS

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FIS Serbia

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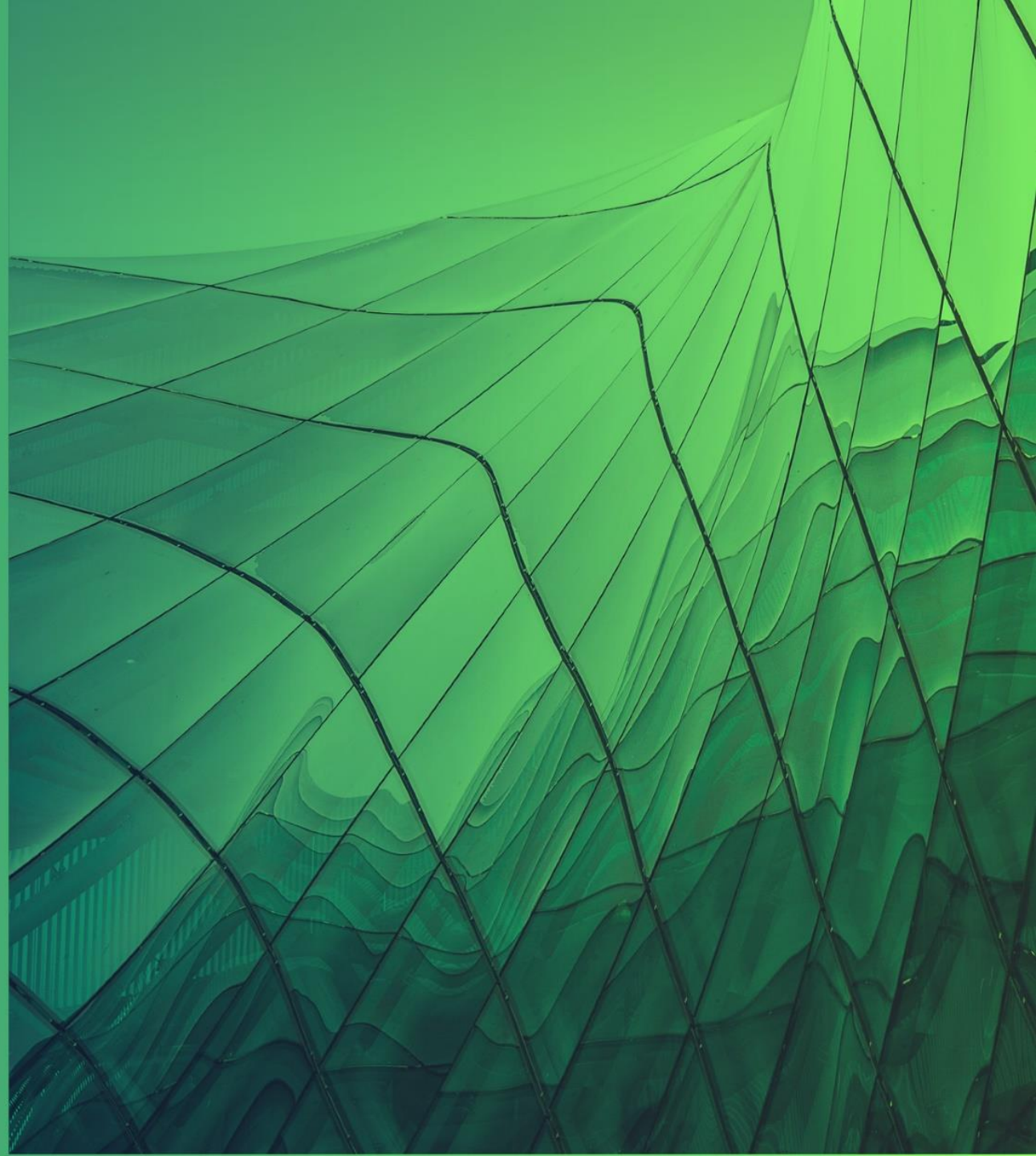


What FIS is doing?

FIS empowers the financial world

$9 BILLION+ in REVENUE

20 THOUSAND+ CLIENTS

53 THOUSAND+ EMPLOYEES

100 COUNTRIES

400+
SOLUTIONS

$9T+
MOVED GLOBALLY ANNUALLY

27B+
TRANSACTIONS PROCESSED GLOBALLY

+40
YEARS FINTECH EXPERIENCE

90%
OF THE TOP 50 LARGEST GLOBAL BANKS ARE FIS CLIENTS

~$1B
INVESTED ANNUALLY IN R&D

80%
OF THE TOP 50 LARGEST ASSET MANAGERS ARE FIS CLIENTS

80%
OF THE TOP 50 LARGEST INSURANCE COMPANIES WORK WITH US

Actuaries – What do they need?

Discounting Cashflows

The value of $100 today is not the same as the value of $100 a year from now.

Accumulated Value

What is the value of $100 today, a year from now?

What is the value of $100 a year from now, today?

Discounted Present Value

Then add in the complications:

- Uncertain mortality
- Uncertain returns on investment
- Uncertain lapses
- Uncertain new business sales
- Guarantees could bite
- Options could be exercised
- Rates of improvement could be different than predicted

Similar Models, Different Purpose

So many models actuaries write will be some kind of discounted cashflow model; working out the current value of 'something', based on the future cash flows.

These could be…

- **Valuation Models – The current value of the company (for Regulatory or M&A purposes, for example), or the current value of assets and liabilities (for selling blocks of business)**
- **Pricing Models – the current value of expected future profits of new insurance products, and how to maximise the present value of those profits.**
- **Capital Models – The current value of the assets which need to be held to demonstrate solvency.**
- **Informational Models – The current value of 'free assets' which could be used for opportunistic purposes.**

And then you want to project these forward.

How big do these models get?

It's somewhere between Data and Big Data

But order of magnitude analysis:

- **10,000 variables**
- **For 40-120 year projection (say, 1,000 months)**
- **For 200 Products codes**
- **Say 200 Sub Products**
- **Testing maybe 30 scenarios**

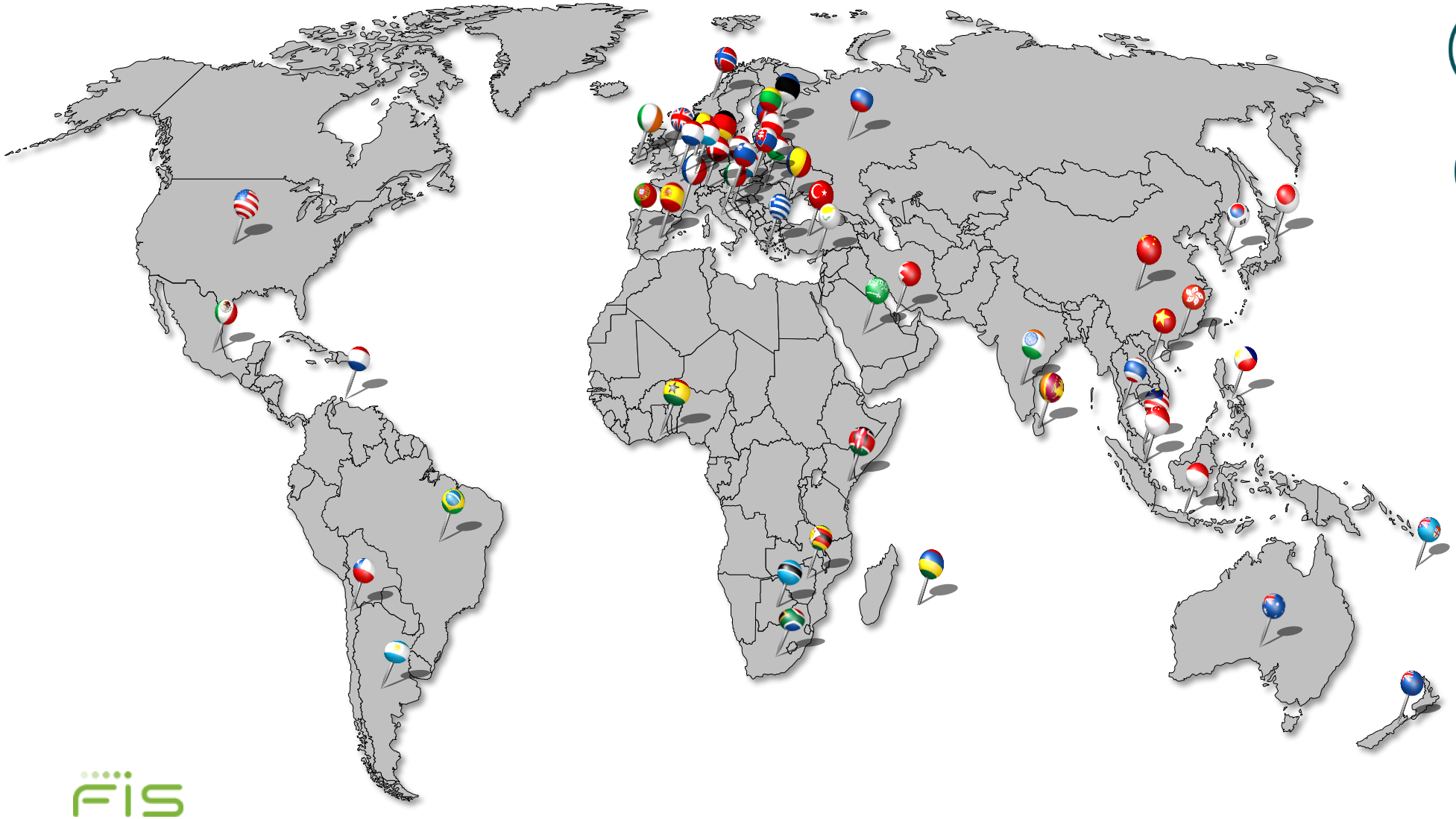
Then you might want to make your run Stochastic (maybe 10,000 sims).

So that's 1 EB

In practice, Clients have to compromise with Projection Term and Variables output to make this tractable for the output, but we've still got to be handling these numbers on the back-end

Insurance Risk Suite (Prophet)

Prophet's global presence



10,000+

1,000+
Customer Sites

70
Countries

200+
Enterprise Clients

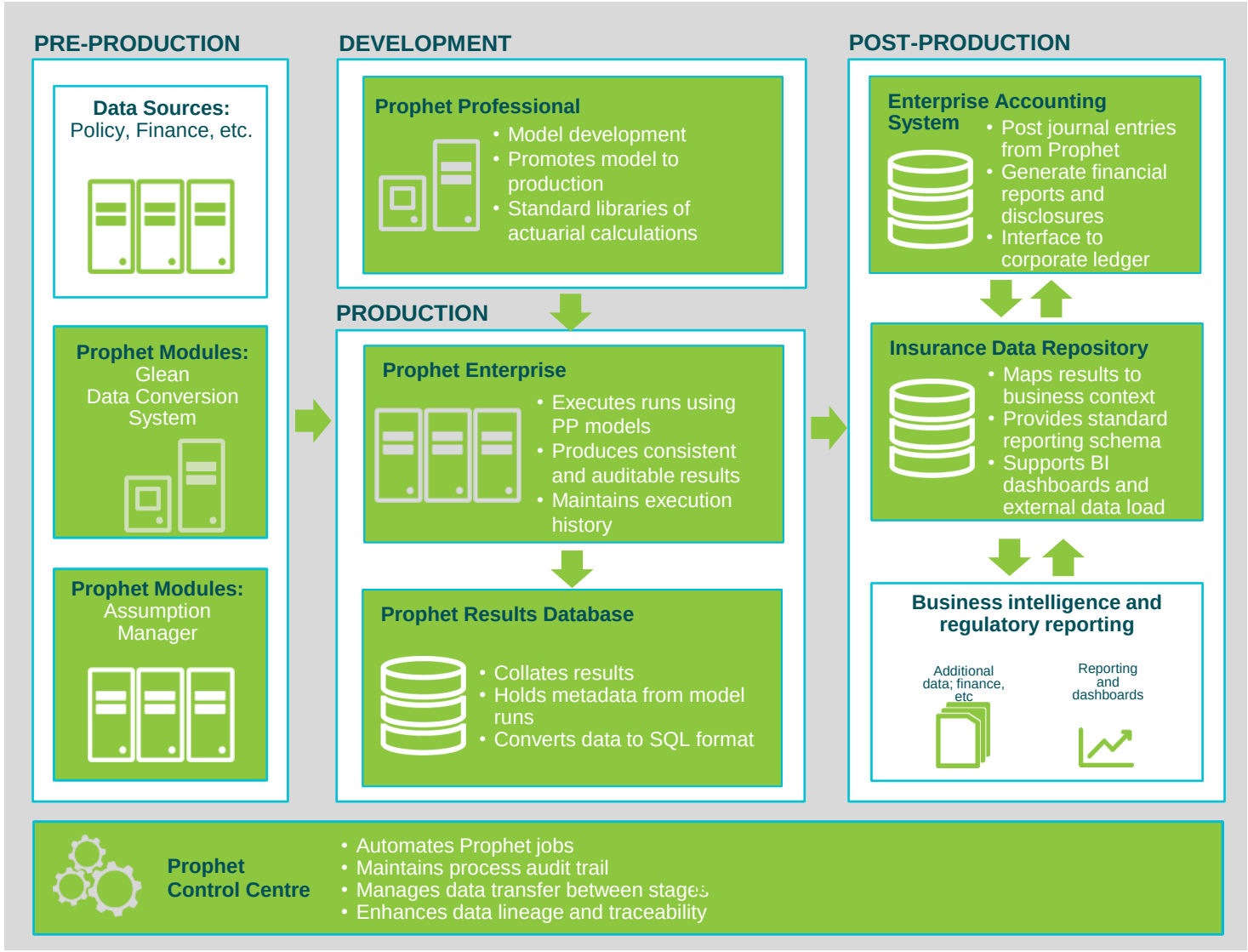
Solution suite

FIS Prophet Reference End to End Solution

Components of Prophet Data Management Platform integrate with most known IT platforms, across a variety of deployment models

Prophet suite components

External components/ sources



On premise installation

Managed Cloud Services

Centralized / decentralized deployments

What is continues delivery?

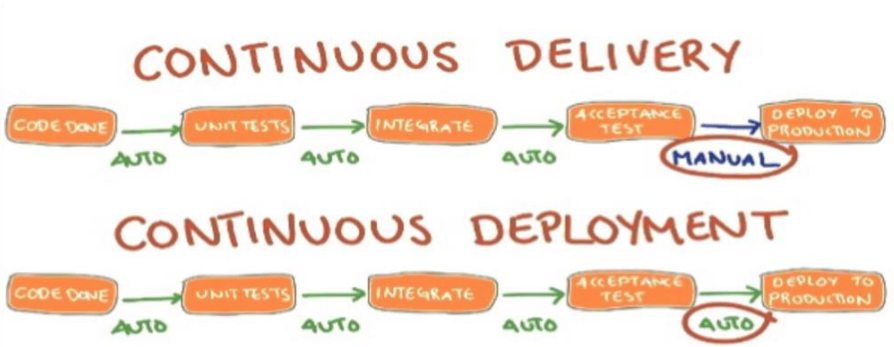
Continuous delivery (**CD**) is a software engineering approach in which teams produce software in short cycles, ensuring that the software can be reliably released at any time and, when releasing the software, without doing so manually. *

* *Chen, Lianping (2015). "Continuous Delivery: Huge Benefits, but Challenges Too". IEEE Software.*

What continues delivery is not ☺

- Continuous integration (practice of integrating code from different sources)
- Continuous deployment (automate the delivery aspect)
- DevOps (broader concept)
- Agile (methodology how to deliver product)
- Scrum (agile framework)
- Cloud
- Microservices architecture

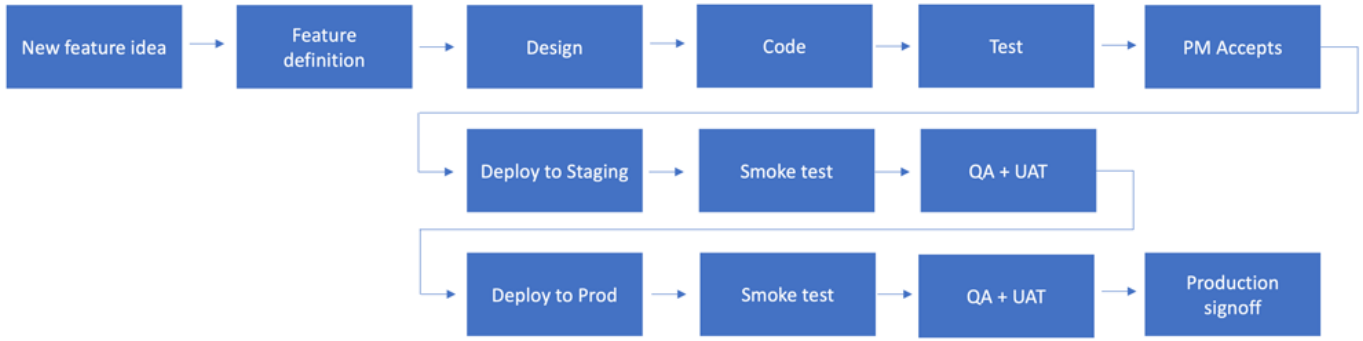
But all above are needed to archive Continuous delivery.



Why it is important for business?

- Release faster value to the customers
- Get early feedback from the market about features
- Reduce costs of deployment
- Force good engineering practices (like Agile, DevOps…)
- Increase the business understanding with development
- Increase the productivity

Typical life of functionality without CD



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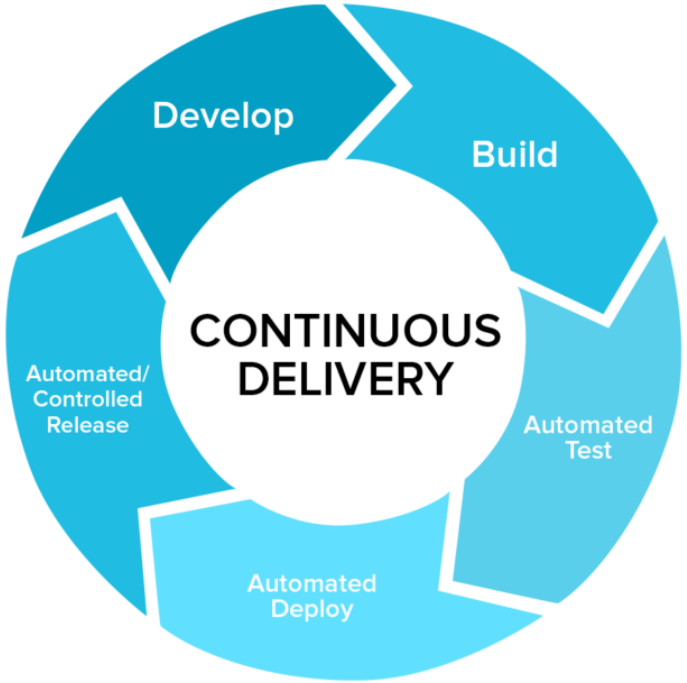
CD process


Develop
Build
Automated Test
Automated Deploy
Automated/ Controlled Release
CONTINUOUS DELIVERY

BUILD
TEST
CODE
BUILD / TEST
PRODUCT
BACKLOG
DELIVERY
HERE COMES THE PRODUCT

Agile principles

Customer satisfactions

Changing requirements

Frequent delivery

Communicate regularly

Support team member

Face-to-face communication

Measure work progress

Development process

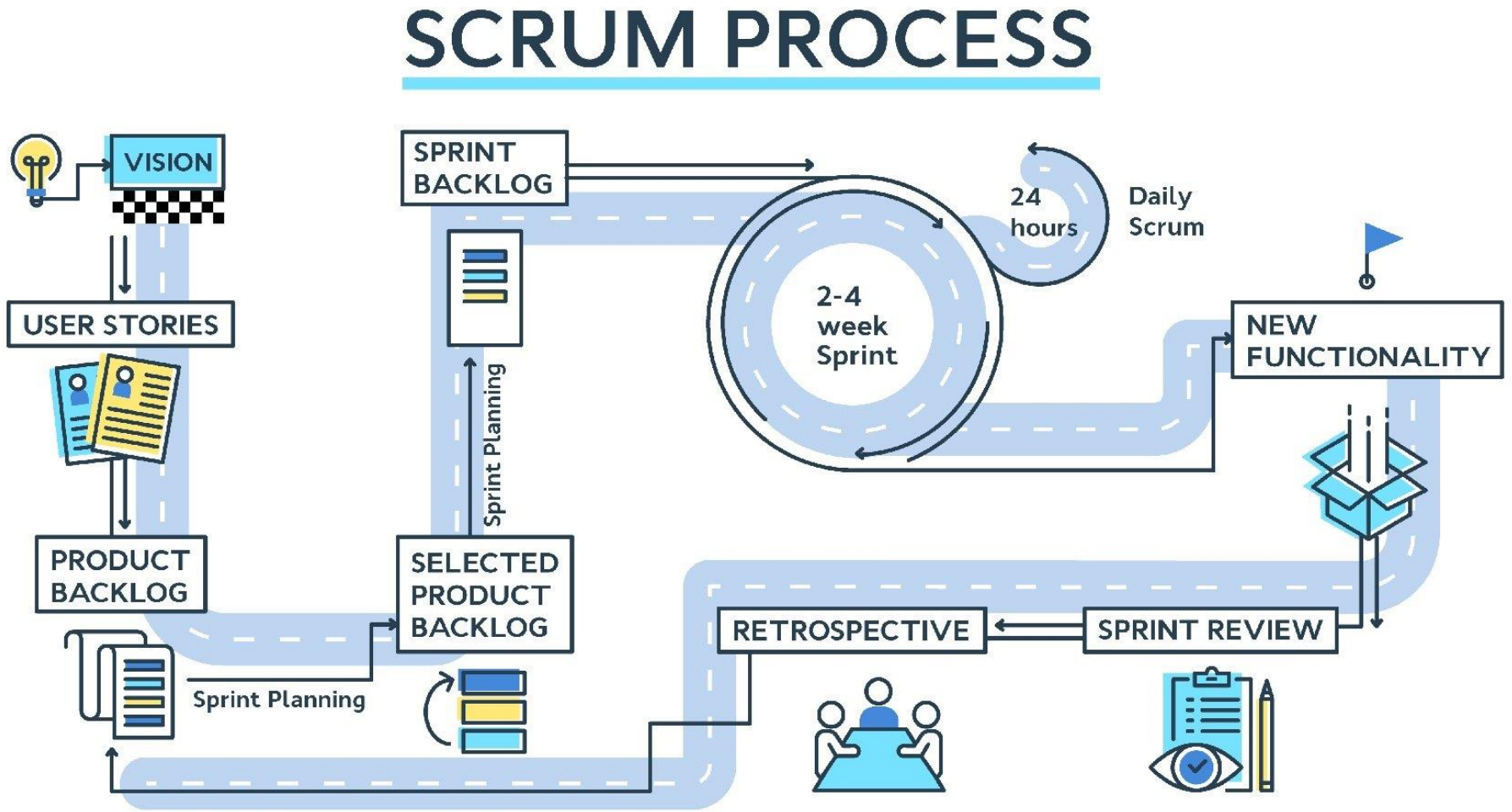
Good design

Measure progress

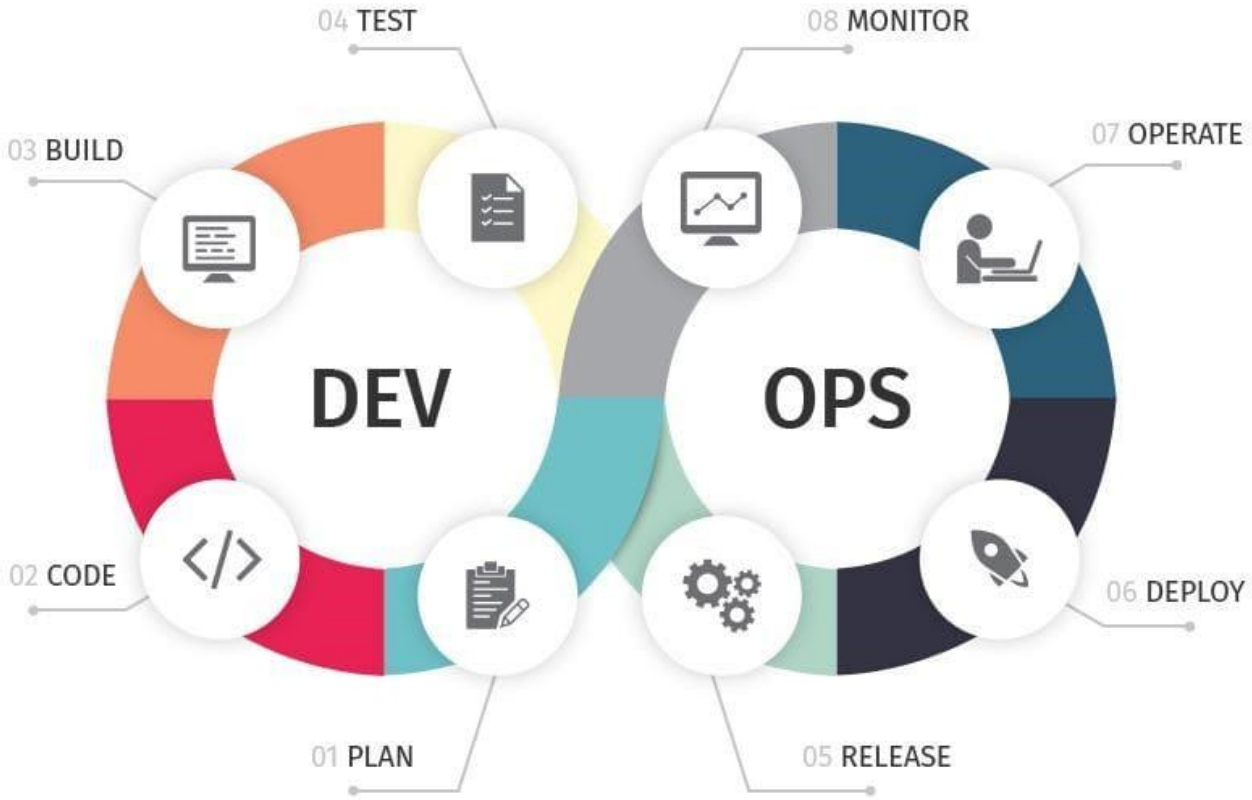
Continue seeking result

Reflect and adjust regularly

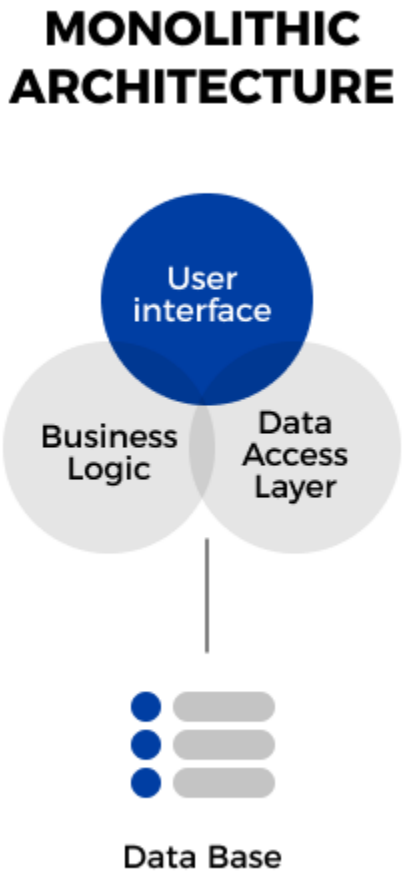
Scrum framework

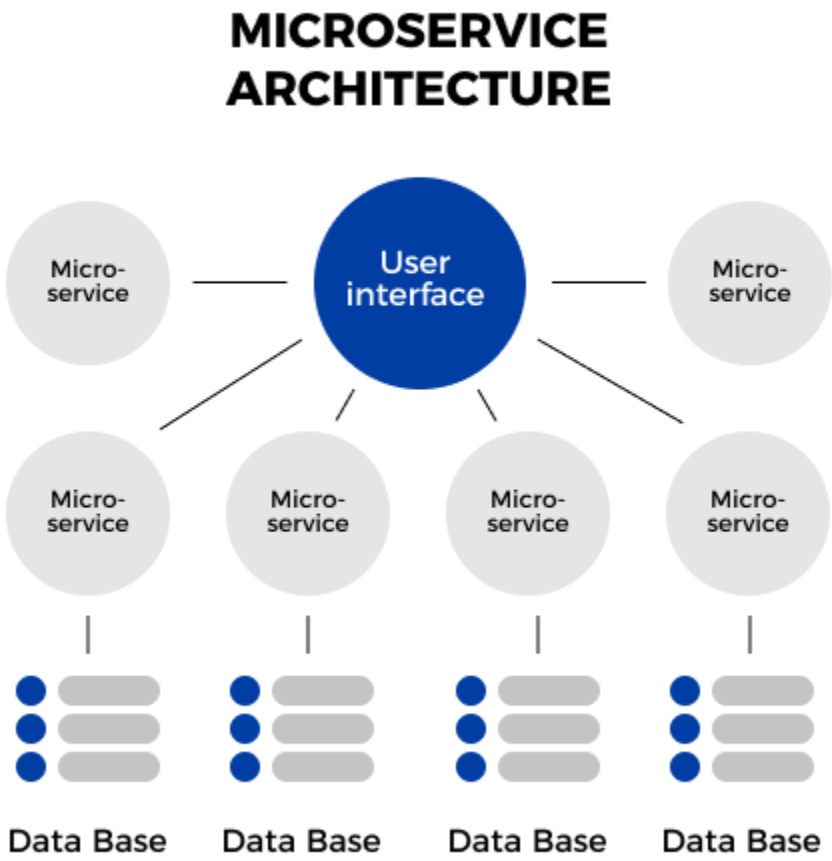


DevOps

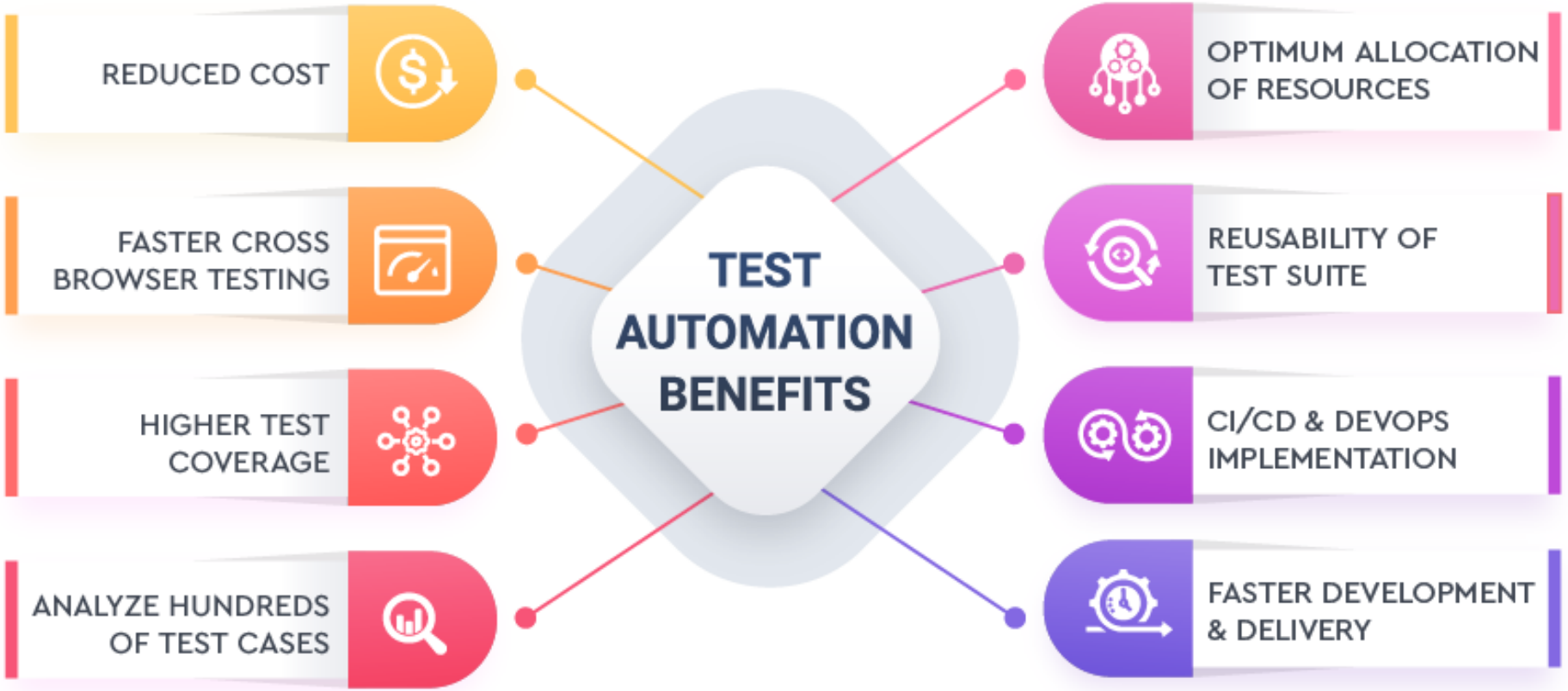

04 TEST
08 MONITOR
03 BUILD
07 OPERATE
DEV
OPS
02 CODE
06 DEPLOY
01 PLAN
05 RELEASE

Microservices

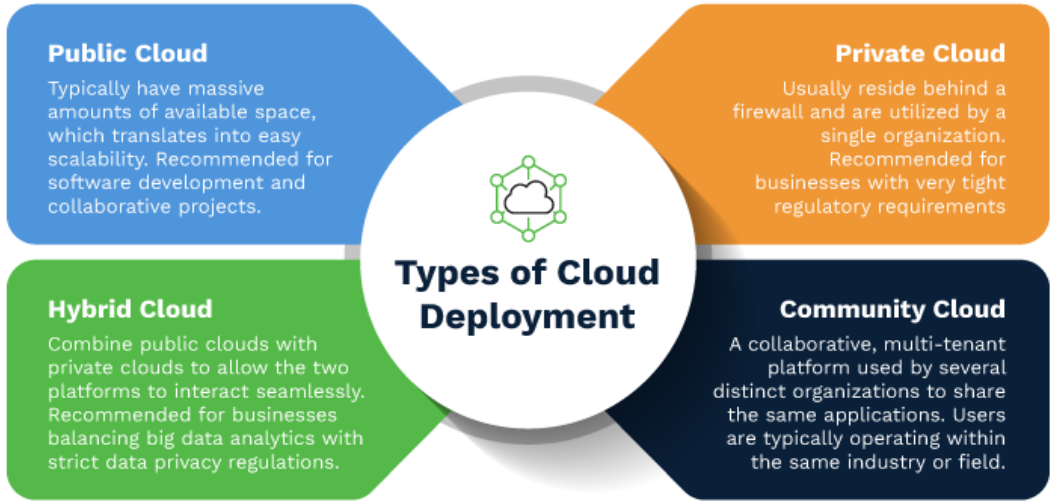




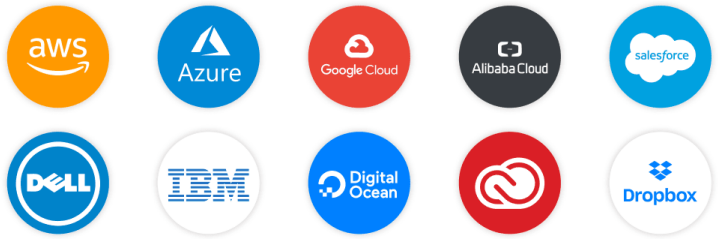
Test automation



In the clouds…



Top 10 Cloud Providers



In practice…

Continuous Delivery earlier (10+ years ago)

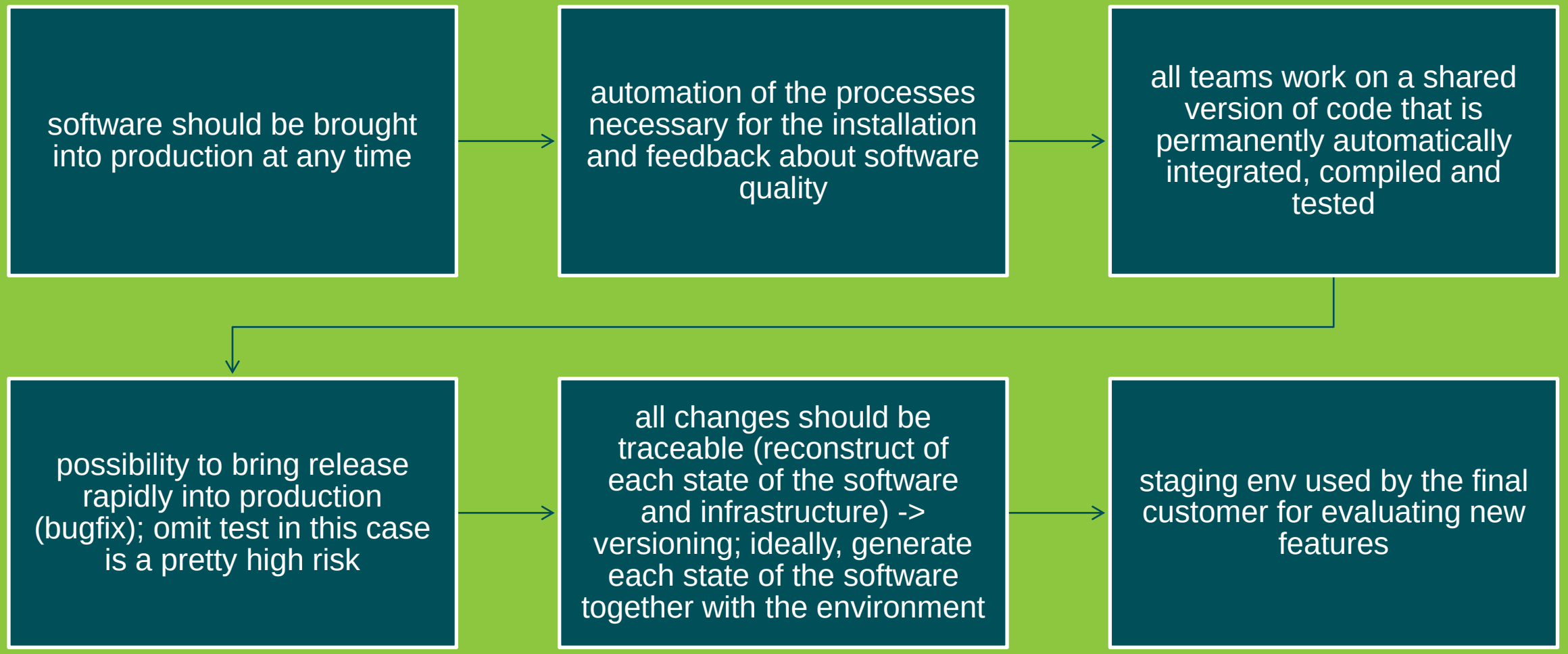
individual teams works independently (when the modules are together for the first time, cannot be compiled)

weeks/months to test & stabilize release in development

testing & installing in Production (months of work)

weeks/months of stabilizing in the production

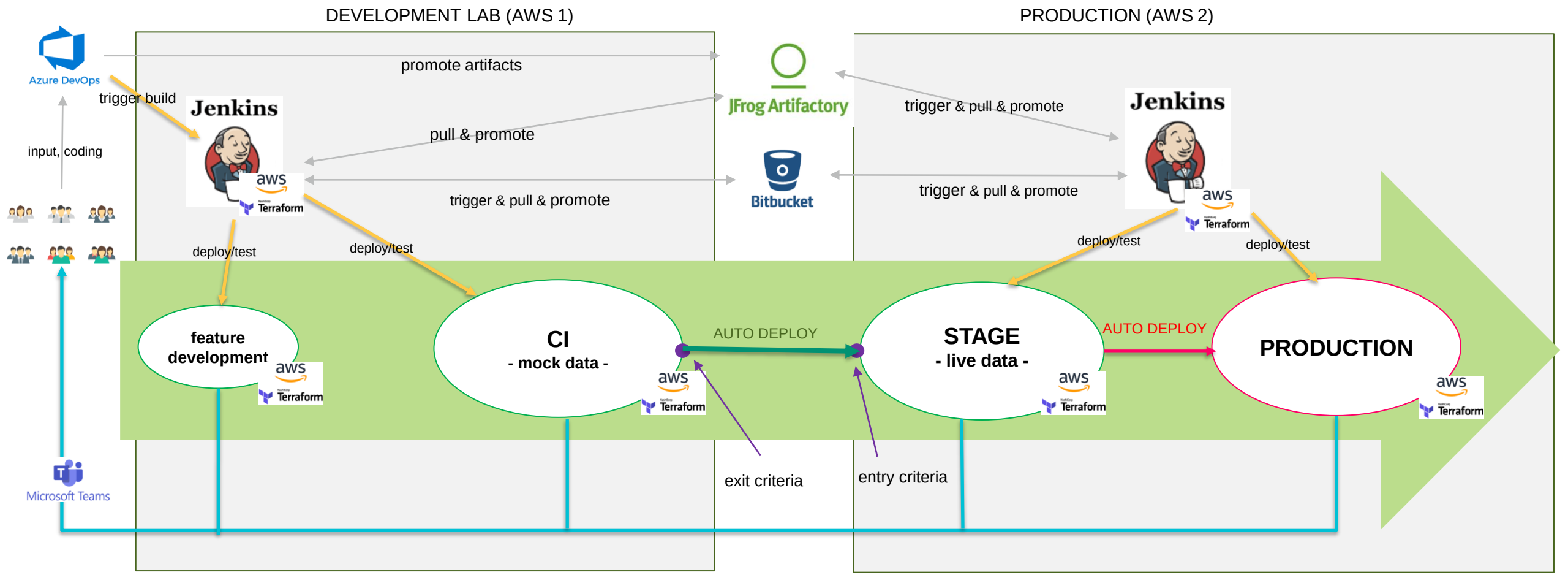
Continuous Delivery today – ideas & challenges



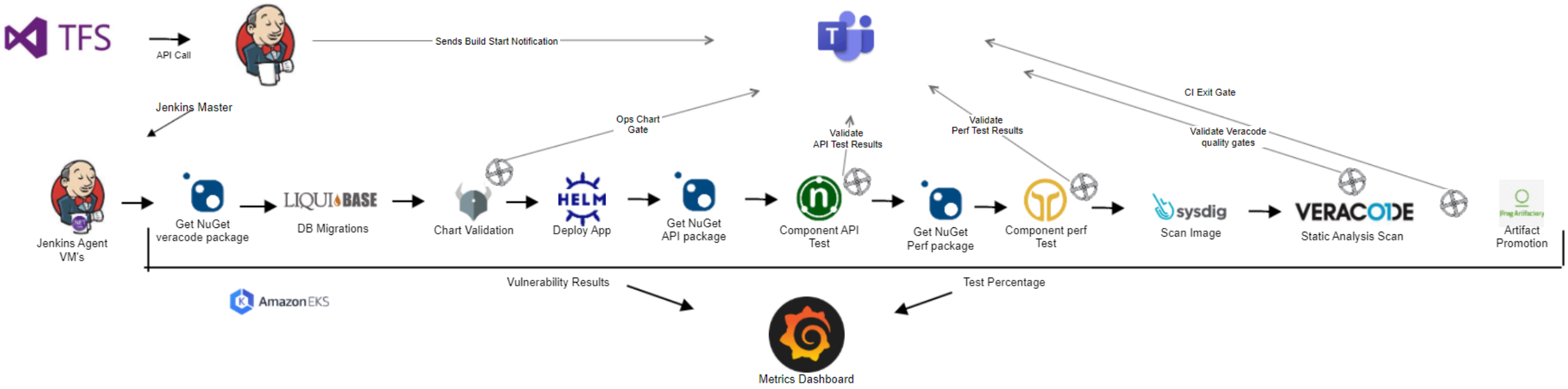
Q: So, what do we need?
A: End to End pipeline; means CI + CD

How have we implemented this in Prophet SaaS?

CI/CD process



CI Jenkins flow



Fundamental principle of CD

If it hurts, do it more often and bring the pain forward!

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FIS Serbia

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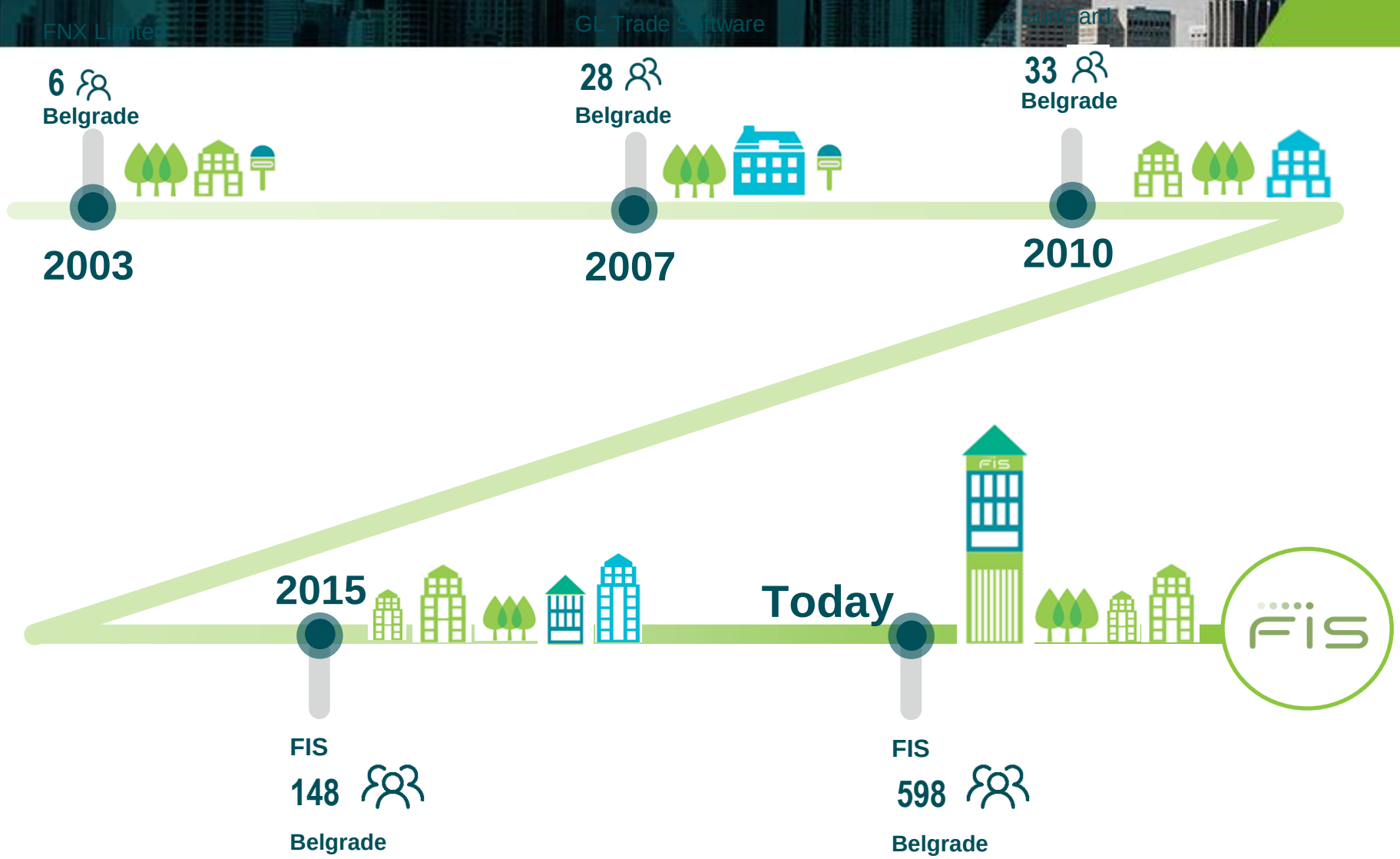
FIS Serbia Retrospective



Our Benefits

Employee Stock Purchase Plan

Generali Private Medical and Accident Insurance

Generali Private Pension Fund

100% Paid Maternity Leave

Vacation

27 vacation days in a calendar year (13.5 for interns).

Compressed Workweek

** managers' approval needed*

Flexible Working Schedule

** managers' approval needed*

FitPass Membership

Back Massages

"Fun Room & Fresh Fruits"

Referral Bonus