



How ABN AMRO accelerates software delivery using CI/CD

- Shifting Left with DevSecOps
- Cape Town / Johannesburg South Africa
- 21th / 23d May 2019
- Stefan Simenon

Introduction



- Stefan Simenon
- Head of IT Tooling & Software Development
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- Studied Physics & Information Technology
- 20+ years IT experience in various roles
- Currently responsible for Tooling, Software Quality & CICD, Cloud Native in ABN AMRO IT department
- Speaker at several software conferences like Jenkins World, XebiaLabs DevOps Leadership Summit, AllDayDevOps, Software Quality & Security conferences



The Netherlands



ABN AMRO is a leading bank in Europe

22,000 internal employees servicing retail, private and corporate finances worldwide

Headquartered in Amsterdam

5,000 associates working in IT

350+ agile teams

DevOps journey ABN AMRO: CICD awareness

2015

Successful
CICD tooling
pilot

CICD
awareness

Challenges Faced at ABN AMRO

Long lead time for software delivery

Software quality issues found at a late stage

Many manual handovers and approvals

Code merging happening at a late stage

Inefficient cooperation between DEV and OPS

Big non-frequent releases to Production

Financial services market is growing fast, on multiple fronts



The case for faster response to client needs is clear



Continuous Integration

Produce automated builds and detect errors as soon as possible, by integrating and testing all changes on a regular (daily) basis.

Continuous Delivery

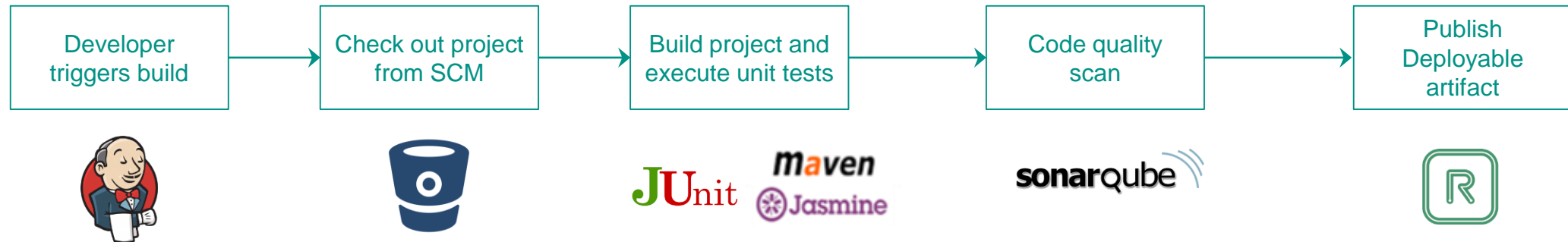
High frequency delivery of a tested functional piece of software that can be deployed to production rapidly.

Continuous Deployment

Fully automated process including deployment to production without human interaction.

Successful CI pilot conducted

- Initial CI pipeline implemented



- CI pipeline used by 5 eager Java/Front End teams
- Benefits made visible and shown to senior management
- Decision by senior management to start program to implement CICD across organization



DevOps journey ABN AMRO: CICD strategic theme

2016

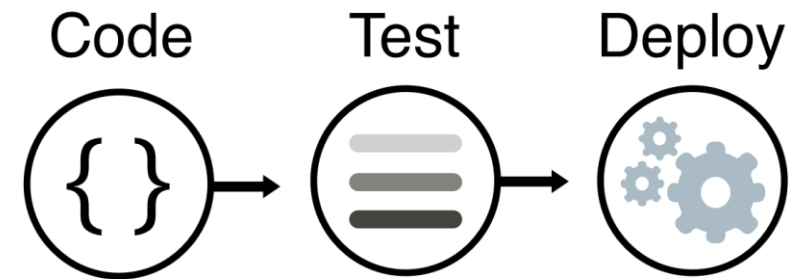
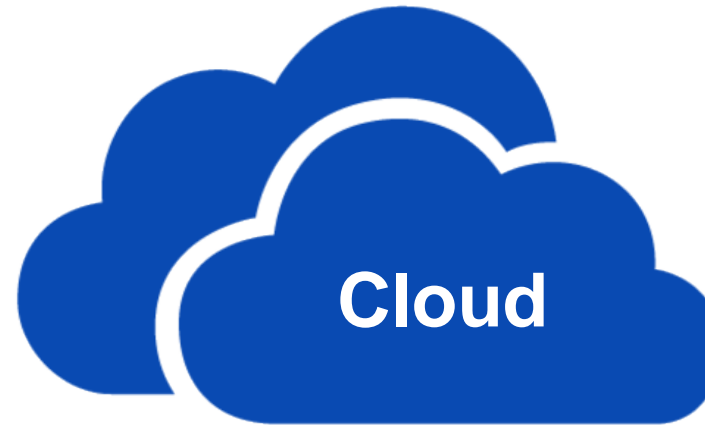
CICD
program

Improve
pipelines

Successful
CICD tooling
pilot

CICD
awareness

CICD: 1 of our 4 strategic themes



Continuous Integration
Continuous Delivery

CICD program: Set-up

PAVE THE WAY

Tooling

Infra prerequisites

Integration

Pipelines

Automated
production
release

MAKE IT HAPPEN

Change Management

Mindset & Behaviour

Simplify processes

Coaching for agile teams

Move to
ET

Extend
techno-
logies

Mature
in UT/ST

Front
end,
Java

Start CICD
in UT/ST

CICD program: Approach

- CICD is not only about tooling but mainly mindset & behaviour, a changed Way of Working and process improvements.
- The project organisation is set up into a cluster with a central and a decentralized orientation.
 1. Pave the way: set up the conditions for the teams to get working.
 2. Make it happen: the actual 'decentral' CI/CD implementation within the teams.
- Agile teams will be supported once the right tools are available, so start with Java/Front End
- Strong alignment across **DEV**, **OPS** and **SECURITY** departments
- We know other large companies which need 3 - 8 years, and changed their approach along the way.
- Therefore we keep the overall stages in mind, but plan for the coming three months. Focus on learning and improving instead of long term planning.

CICD awareness program to help us grow



CICD summer boost
Leadership events
Advocate CICD
Changed WoW



Various communities set up
Internal meet ups & hackathons
Celebrating successes
Sharing failures
External speakers



CICD coaching
CICD E-Learning
Knowledge sharing
Best practice sharing
70:20:10 methodology
Certification

DevOps journey ABN AMRO: Scaling and becoming mature

2017

Dev
Sec
Ops

IT4IT
organi-
sation

Hybrid
cloud

Mature
CICD
pipelines

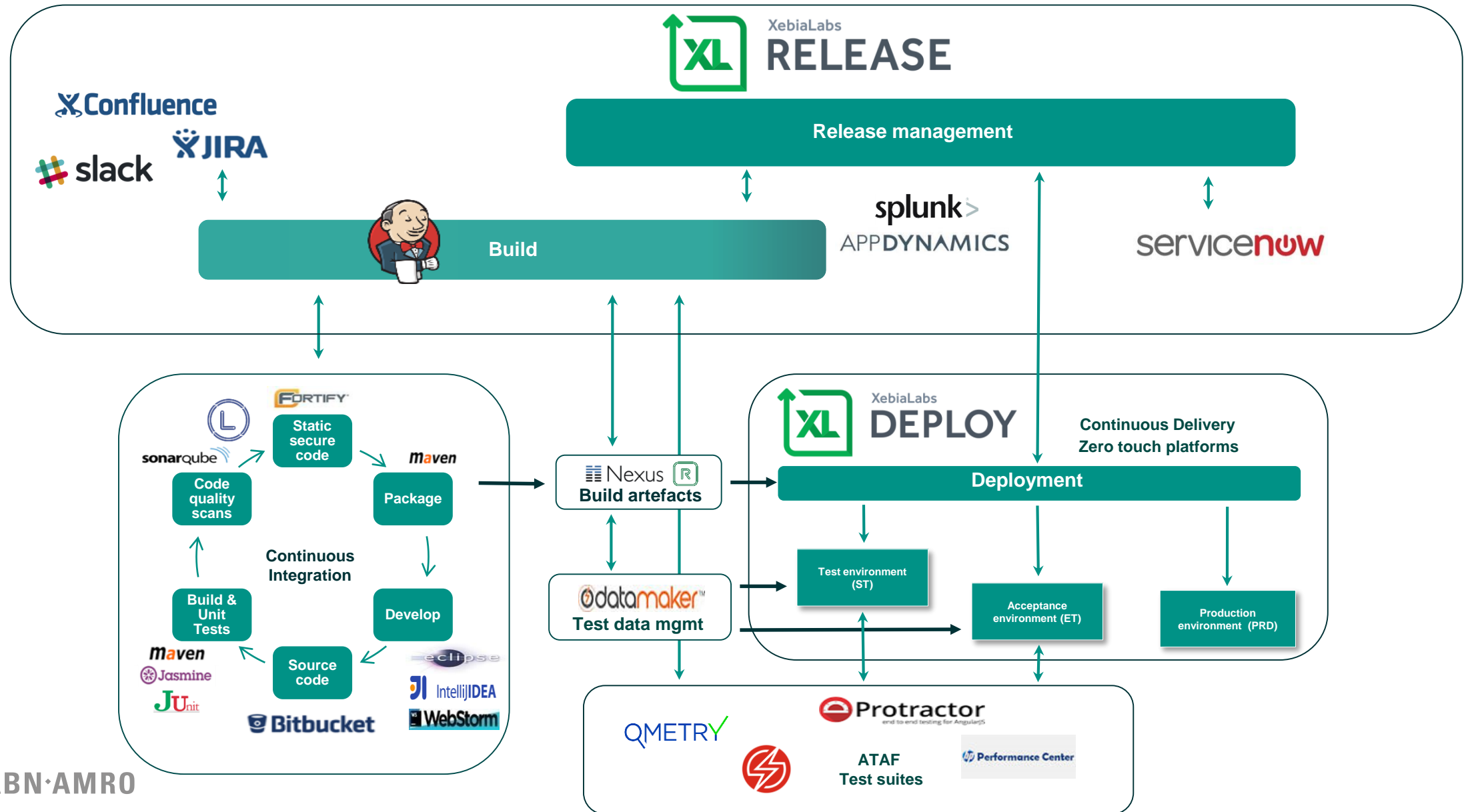
Improve
pipelines

CICD
strategic
theme

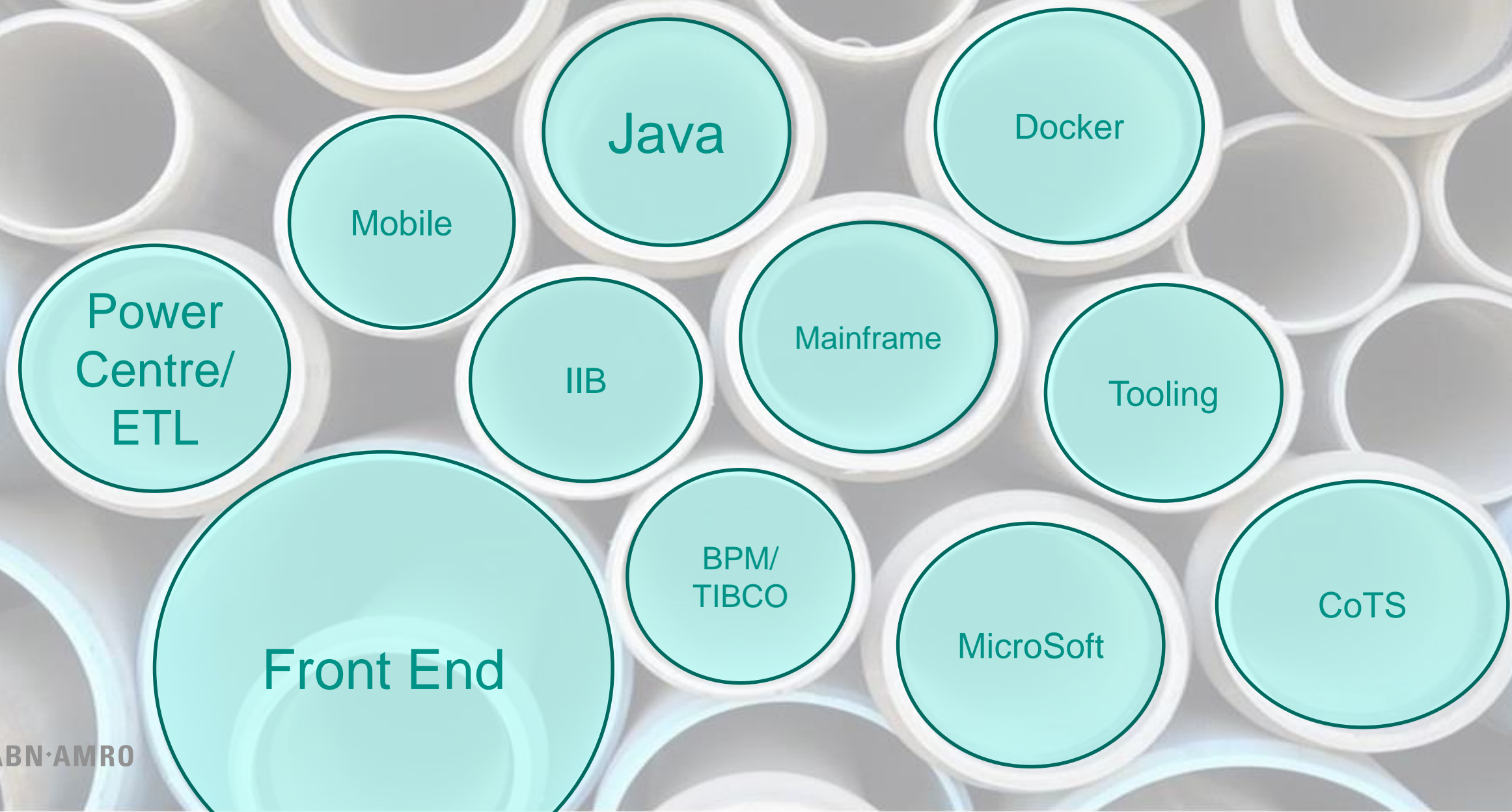
Successful
CICD
tooling pilot

CICD
awareness

Midrange Build & Delivery pipeline: orchestration



Pipelines within ABN AMRO



DevSecOps: How to include Security in our DevOps

Secure coding

Open source libraries

Dynamic Application Security Testing

Container Security

Secrets Management

Open Source Software

- ❑ “Open source and third-party components can help organizations speed development and reduce cost, but they can also increase risk exposure when organizations do not manage them effectively. Evaluating and approving standard components helps organizations streamline their software supply chains, improve quality, and reduce risk and cost.”
- ❑ By 2020, 50% to 80% of code in new applications will come from external third-party channels.”
- ❑ “By 2020, 50% of organizations will have suffered damage caused by failing to manage trust in their or their partners', software development life cycles — causing revenue loss of more than 15%.”
- ❑ “31% suspect or have verified a breach related to open source components in the last 12 months (compared to 14% in 2014)”
- ❑ “It takes 3 days before a hacker does exploit a vulnerable open source component (compared to 45 in 2006)”

NATIONAL

Equifax CEO out after data breach that affected 143 million people

By AP Author

Posted: 8:25 AM, September 26, 2017
Updated: 9:48 AM, September 26, 2017

TNIE Exclusive: Ever used India Post? Well your information is vulnerable to hacking

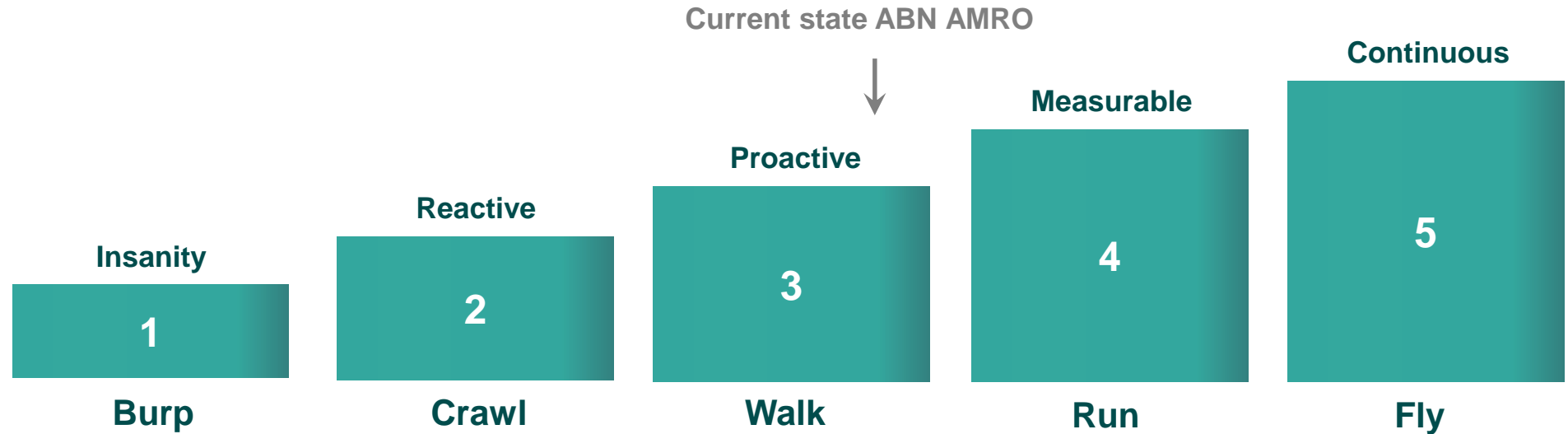
The attacks were carried out using a flaw in Apache Struts, a Java platform used by the Department of Posts to develop Java applications.

Eight More Struts Breaches

by Derek Weeks on May 07, 2018

When using vulnerable versions of the framework, organizations are breached. Everyone knows the Equifax story, but for folks like me who have been paying closer attention, the story also includes the Canadian Revenue Agency, Okinawa Power, the Japanese Post, the India Post, AADHAAR, Apple, University of Delaware, and the GMO Payment Gateway.

DevSecOps maturity model



CULTURE	Surprising with a lots of push back	Full awareness but feeling helpless	Integrated and talked about by Execs	Measured by Execs	Context driven decisions
SKILLS	Skills developed outside job function	Skills lining up with job functions	Skill development paired with the job	Proactive skill development to meet roadmap needs	Knowledge evolves inline / Lessons savored
PROGRAMS / OUTCOMES	Just getting by	Orderly processes & faster reactions	Reduced number of incidents	Measurable difference in attacks	Predictive & Proactive
SECURITY PRIORITIES	P0/critical waiting for attackers	P0 and P1s some hygiene, getting fixed	P0 and P1 compliance	Attack surface driven & measured	Staying ahead of bad guys

Security improvements

**Security
training**

**Automated
onboarding**

**Monthly
rewards for
teams
delivering
security
improvements**

**Security
quality
gates in
pipelines**

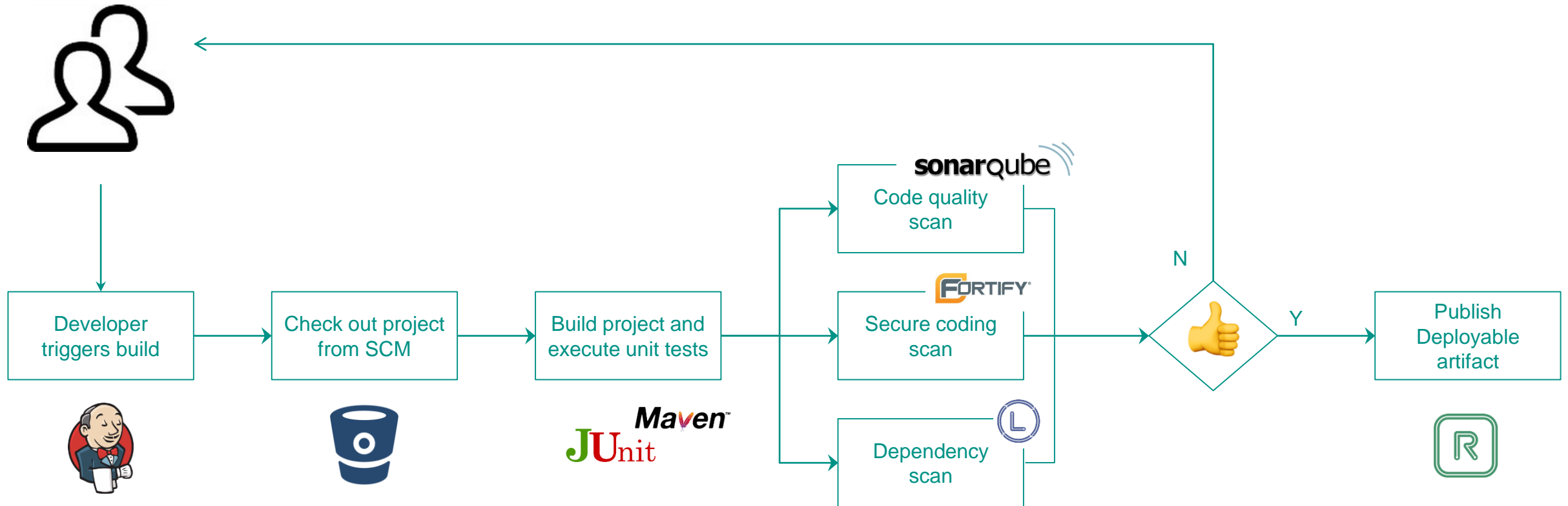
**DevSecOps
meetups**

**Green
light
festivals**

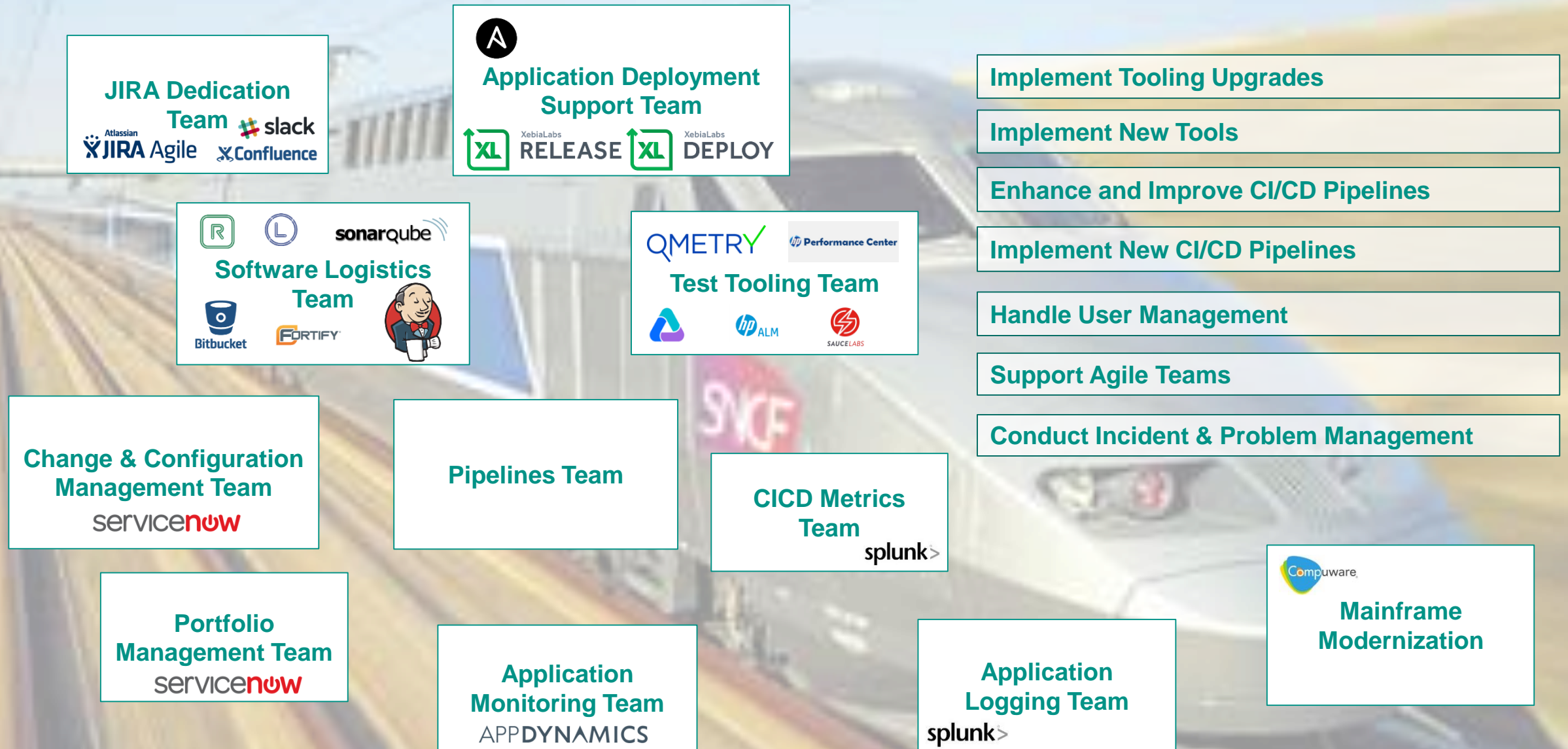
**Security
dashboard
for senior
management**

**Up to date
open source
policy**

DevSecOps: Standard CI pipelines and build breakers



IT4IT Organisation Set Up to Enable CI/CD Implementation



Hybrid Cloud set up



Private Cloud (IBM CMS)

- ❑ Consists of hardware deployed within ABN AMRO data centres
- ❑ ABN AMRO controls the underlying infrastructure, IBM manages CMS
- ❑ IaaS solution, provisioning of Virtual Machines
- ❑ Limited PaaS
- ❑ Currently majority of applications run on CMS



Public Cloud (AWS, Azure)

- ❑ Offers advanced PaaS, IaaS
- ❑ Increased developer productivity due to large suite of out of the box technologies and services
- ❑ Delivers an automated and native platform for Agile and DevOps
- ❑ Pay as you go: pay only for the used services
- ❑ 50-100 applications on Public Cloud in 2018

DevOps journey ABN AMRO: Scaling and becoming mature

2018



Growing awareness of key principles next to pipelines

1.

Run pipeline locally

2.

Integrate quickly and often

3.

Practice test driven development

4.

Keep changes small

5.

Get continuous feedback

6.

Decomposition

7.

Have a fast pipeline

8.

Automated unit testing

9.

Trunk based development

10.

Automate everything

Cloud Native / Moving towards containers



Increased development speed

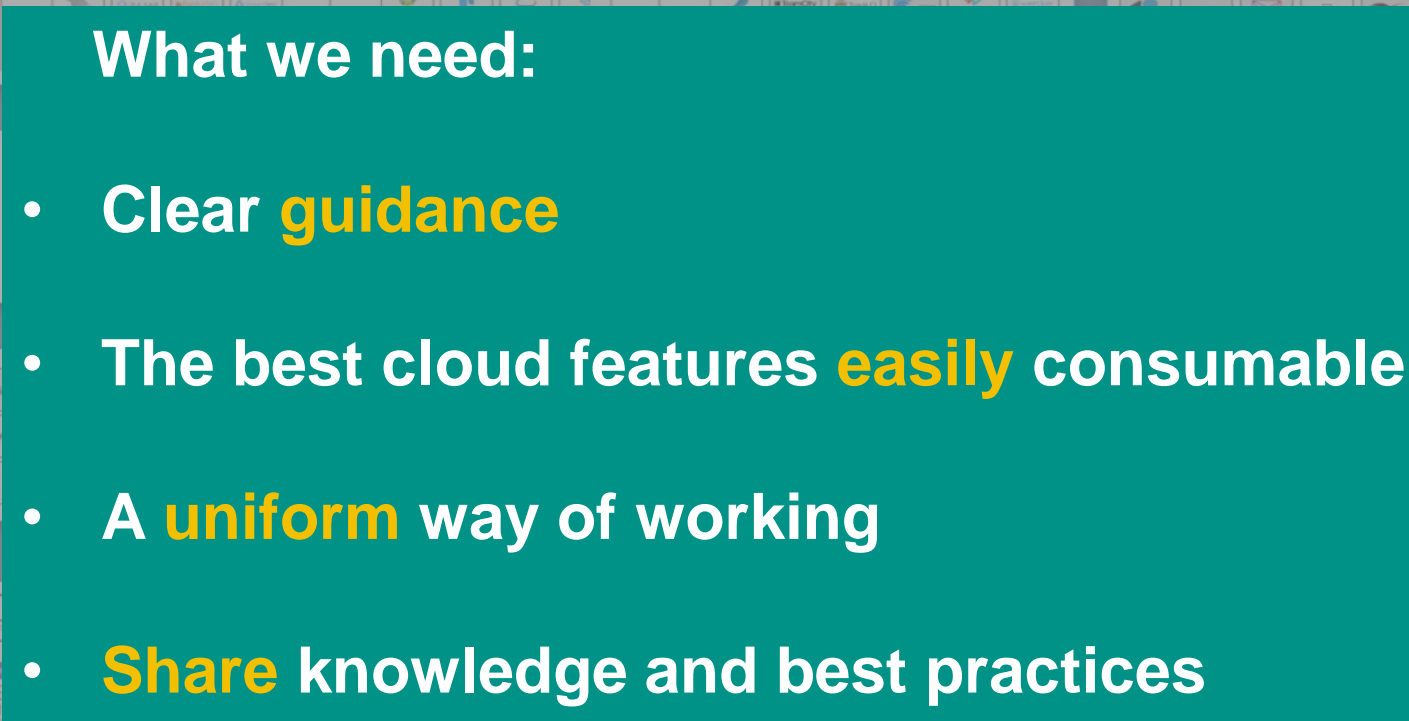
Flexibility

Unified environments

Cost efficient

Supplier Software in containers

Employee satisfaction



“low-level clouds characterized by horizontal layering with a uniform base.”

Stratus' mission

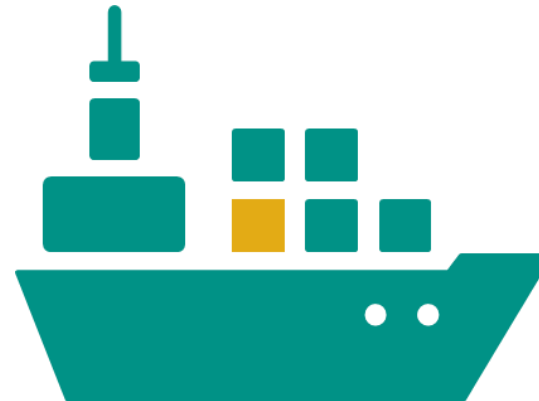
to enable development teams to quickly deliver secure and high quality software by providing them with:



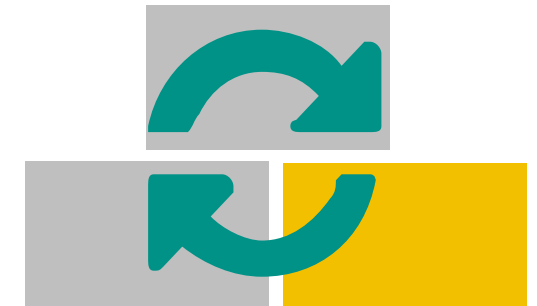
Easy-to-use
Platforms



Security

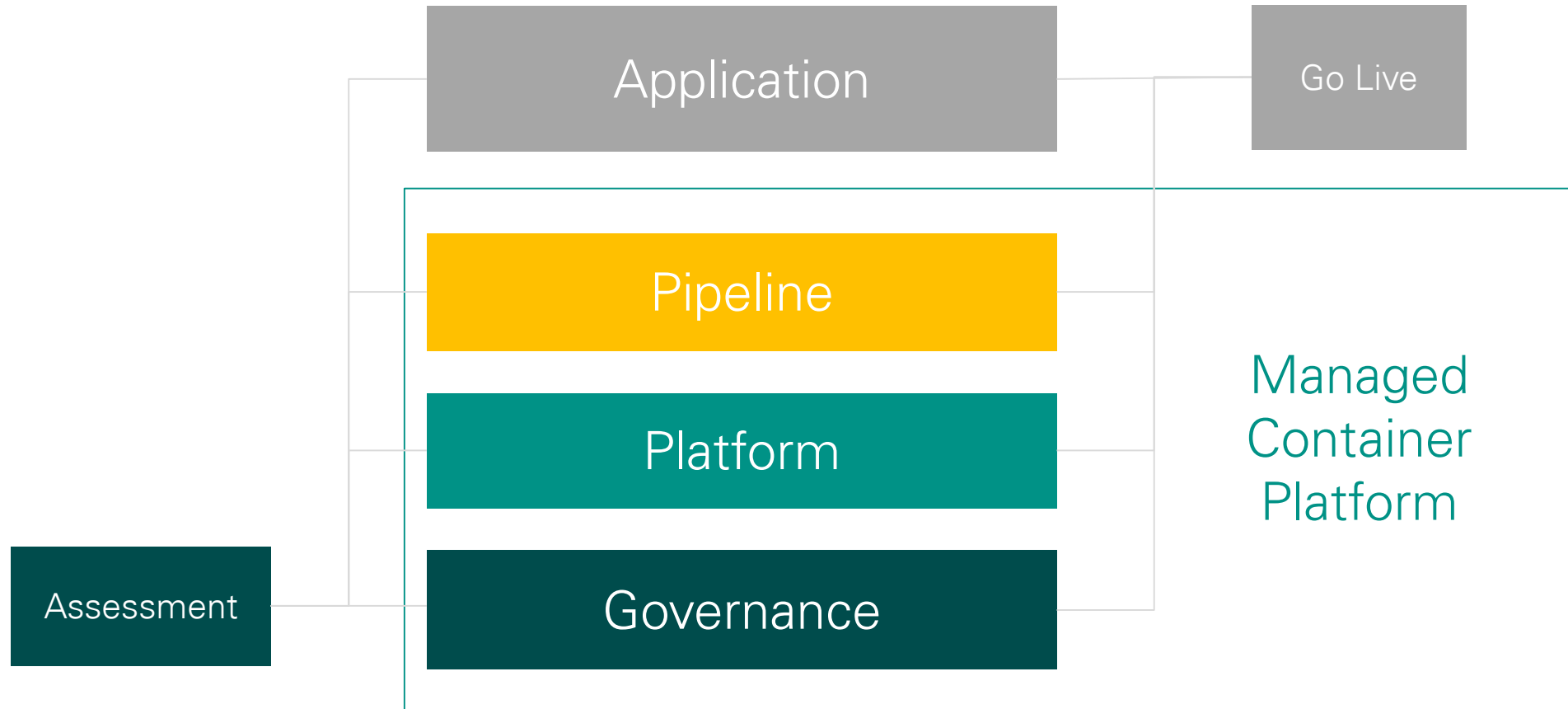


Portability across
clouds on
enterprise level



Re-usable
software
components

Compliance and governance framework

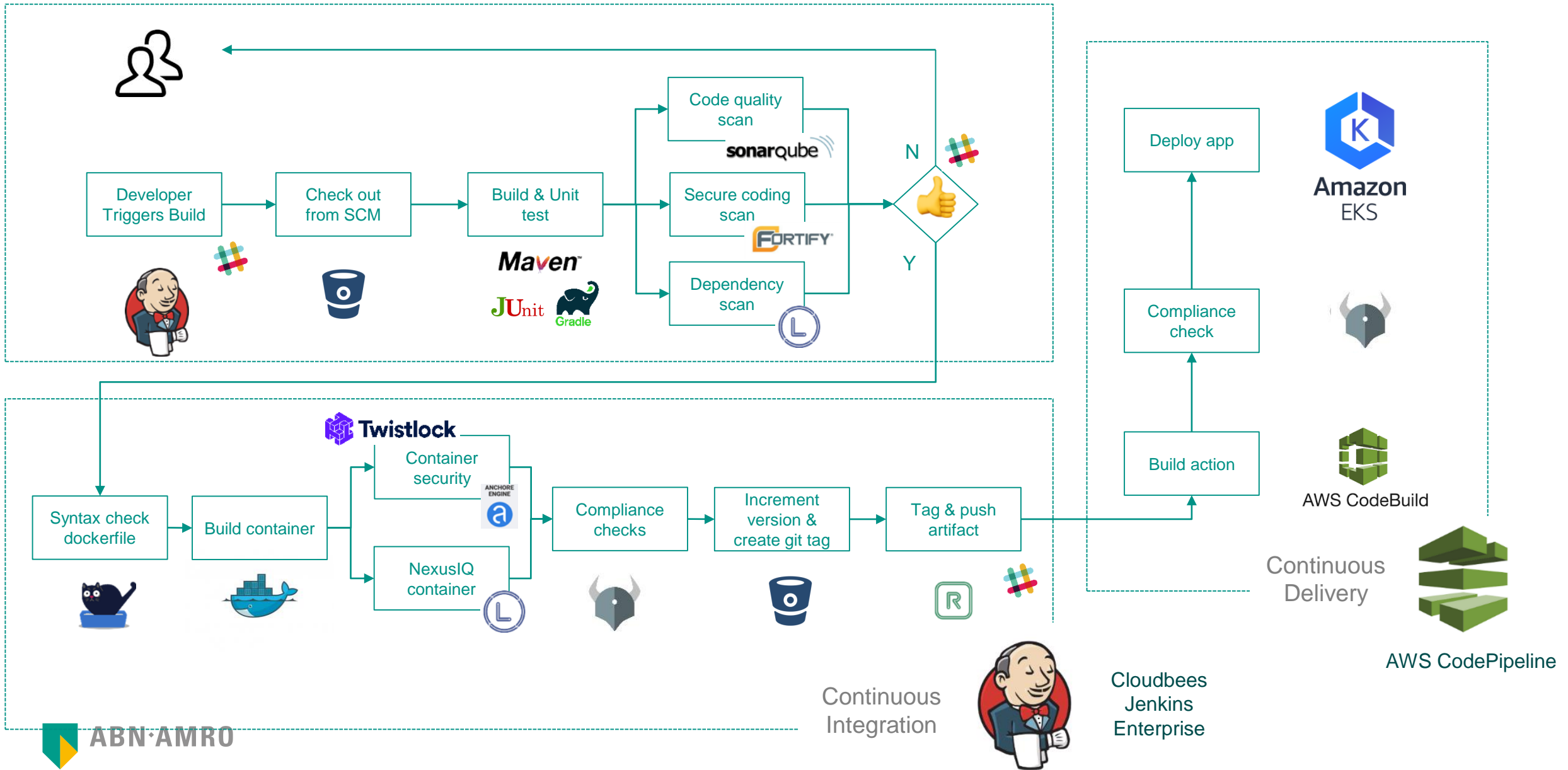


Platform

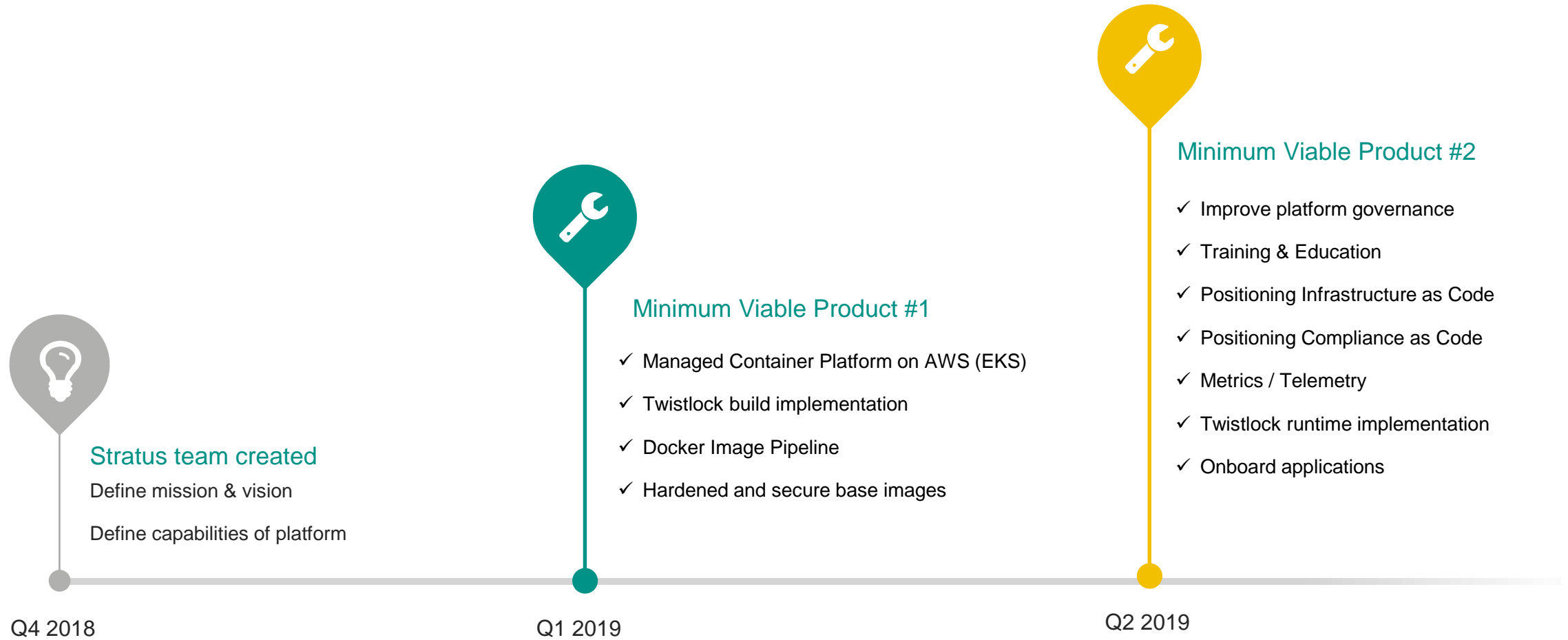


Level	APPLICATION	App definition & Image build	CI/CD		Container scanning	splunk> Prometheus ... MONITOR & LOGGING		
		HELM	cloudbees	Jenkins	Azure DevOps		Twistlock	
	ORCHESTRATION						Secrets management	
		Amazon EKS					Azure AKS	Vault
	RUNTIME	Persistent storage	Container runtime	Network			Compliance	
		To be determined	docker	CNI				
	PROVISIONING	Automation & Config	Docker Registry					
		Terraform	Nexus					
	INFRA					SECURITY		
		amazon web services	Microsoft Azure					

Standard Pipeline Dockerized



Roadmap



CICD Metrics

Code quality, secure coding, open source

Build duration, build result, build errors

Release, deploy, test

Velocity, time to market, release frequency

Aggregate to team and domain level

Trend and detail information

Increased awareness for QA and secure coding

Fact based dialogues between teams and mngmnt

Release lead times

Team autonomy improved by real-time view

Trends and indicators on enterprise level

Audit-trail on the SDLC

splunk®

Realised benefits within ABN AMRO

Test environment uptime improved

Improved code quality & secure coding

Improved cooperation across stakeholders

Improved time to market

Improved development processes

Increased velocity

From 4 Internet Banking releases to 18 releases per year

Core review times have been shortened and violations when merging are being prevented

Changes are being rolled out as soon as they are available

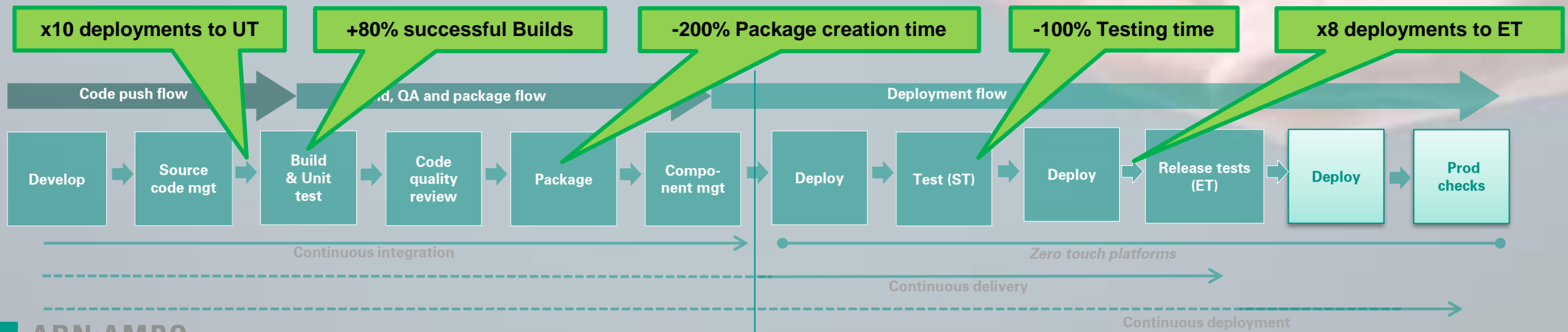
We never thought it would be possible to develop, test and deploy something completely in one sprint

I-Markets doubled velocity after 1 sprint containing CI/CD improvements only

Private Banking International team reduced build from 5 hours to 5 minutes

First continuous deployment realised by identity access mgmt team

Release times halved for teams using XL Release



Learnings



Senior management commitment & involvement

Invest in reducing technical debt

Create a safe environment (failing is ok)

Do not focus on tooling only

Do not underestimate the journey and complexity

Do not focus on long term milestones



Way forward

Automate and improve tooling pipelines

Further transform to DevSecOps

Improve WoW and Mindset & Behaviour

Facilitate increased team autonomy

Focus on Public cloud

Database automation

Focus on controls

Questions

