# How We Try to Make a Lion Bulletproof

Setting Up SRE in a Global Financial Organization

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## ING aan kop bij bankstoringen

Rekeninghouders van ING hebben dit jaar tot nu tot 142 dagen last gehad van storingen, waarvan 18 dagen zeer grote storingen. In de maand september telde de bank tot en met maandag 29 september 20 storingsdagen, waarvan 3 grote storingsdagen. Dat blijkt uit een analyse van Allestoringen.nl. ING gaat hiermee aan kop van de ranglijst van banken met de meeste storingen.

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'ING zag in verhouding tot vorig jaar het aantal storingsdagen met 216 procent stijgen', zegt Tom Sanders, medeoprichter van Allestoringen.nl. 'In de praktijk heeft de digitale dienstverlening van ING elke 15 dagen last van een grote storing, en zijn er om de dag grote of kleine problemen. Voor alle banken gezamenlijk is het aantal storingsdagen over 2014 met 165 procent gestegen ten opzichte van dezelfde periode in 2013."

**ING Nederland**
@ingnl

Betalen via Mijn ING is op dit moment niet mogelijk. Betalen via Mobiel Bankieren app is wel mogelijk. Excuus voor het ongemak.
9:25 AM - Sep 29, 2014

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**"ING in lead position in online banking outages"**

In 2014, our online banking customers experienced outages on 142 days of the year. Our customers experienced larger scale outages every two weeks.

Since 2014 our outages have appeared in the news at least once, often multiple times, a year.
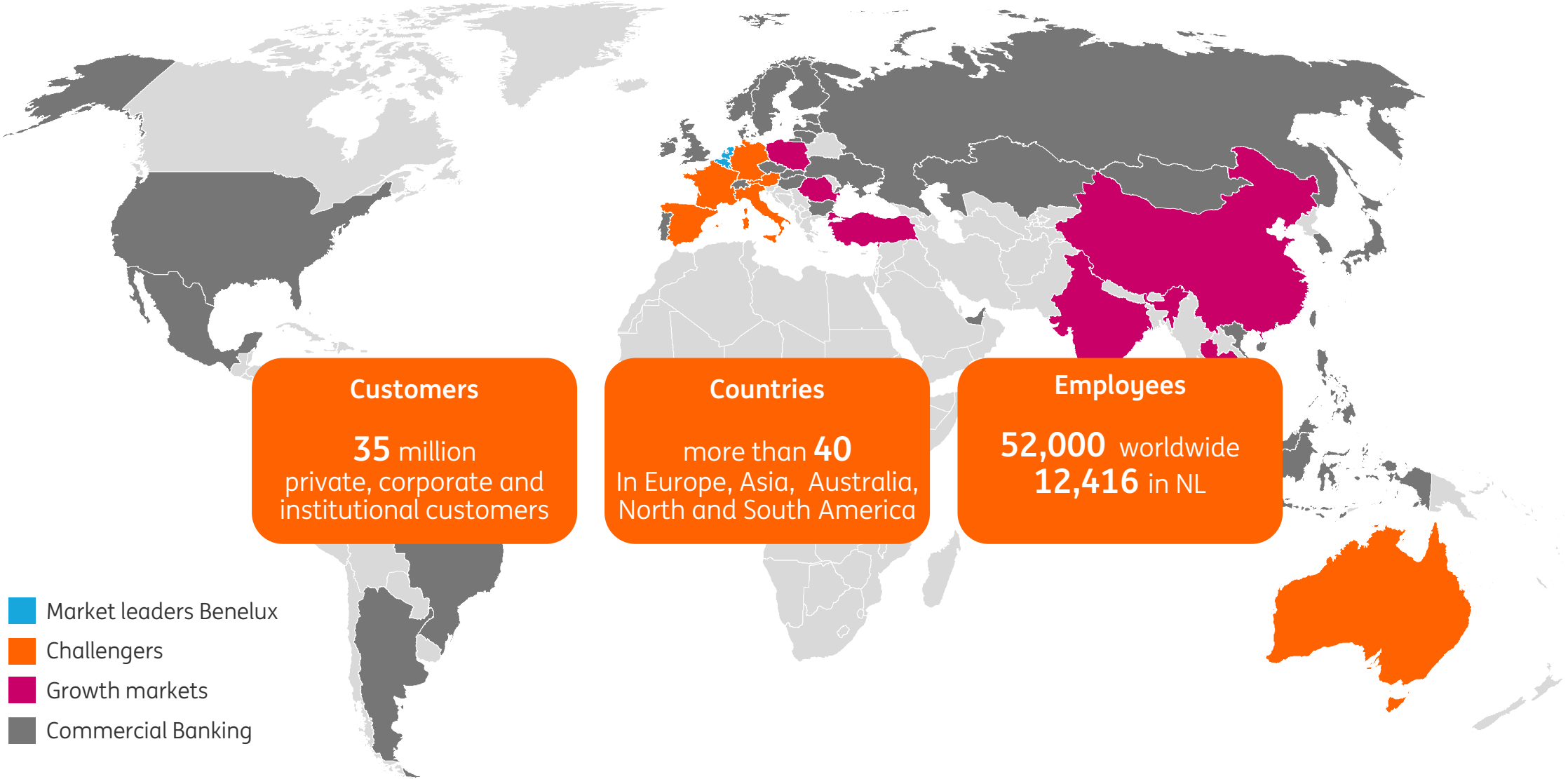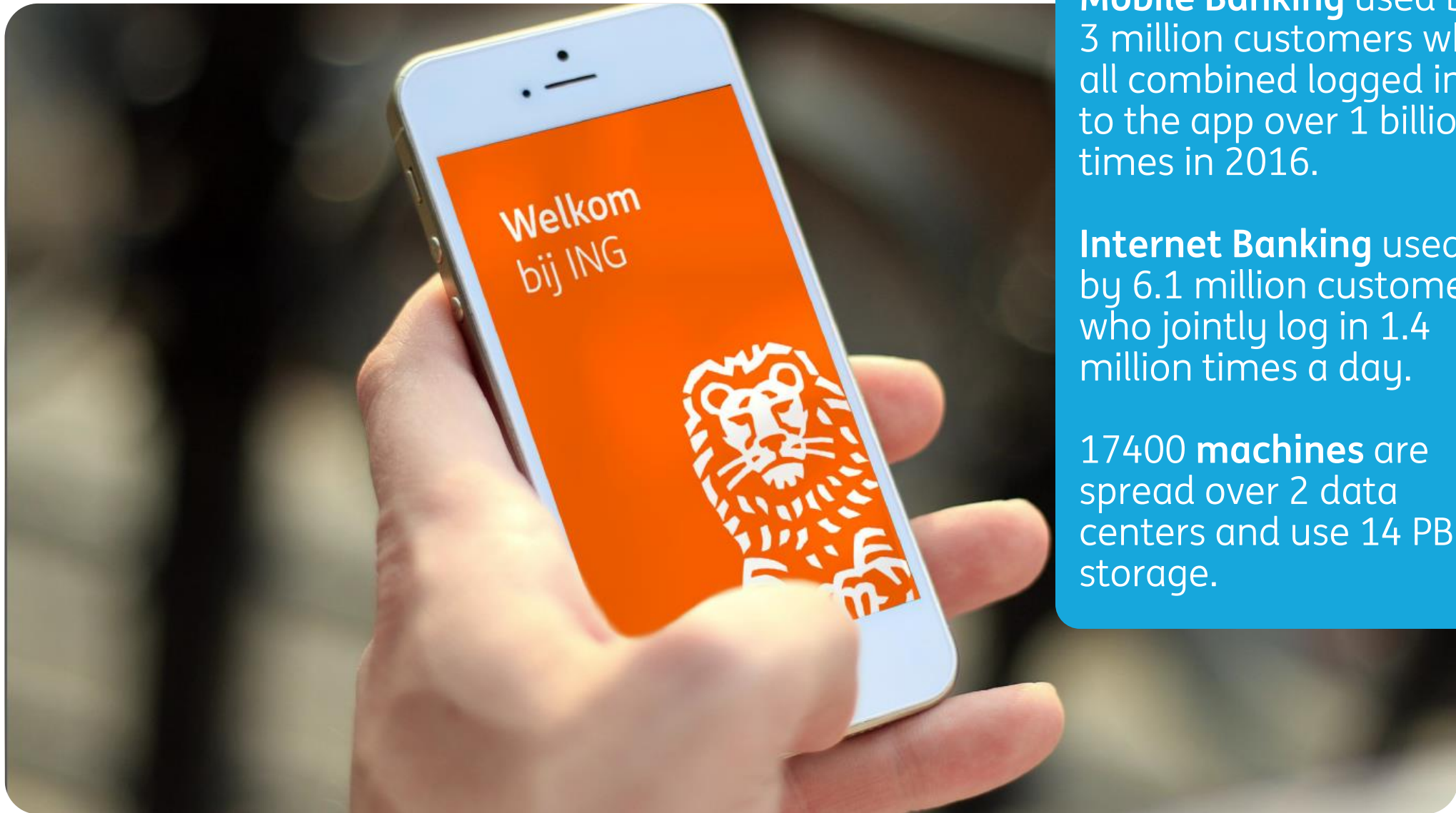
# Introductions



**Janna Brummel**
IT Chapter Lead SRE at ING



**Robin van Zijll**
Product Owner SRE at ING

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# ING is a global financial service provider servicing more than 35 million customers. In the Netherlands we are the banking sector market leader with over 8 million retail customers

**Customers**

**35** million
private, corporate and
institutional customers

**Countries**

more than **40**
In Europe, Asia, Australia,
North and South America

**Employees**

**52,000** worldwide
**12,416** in NL

- Market leaders Benelux
- Challengers
- Growth markets
- Commercial Banking

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**Mobile Banking** used by 3 million customers who all combined logged in to the app over 1 billion times in 2016.
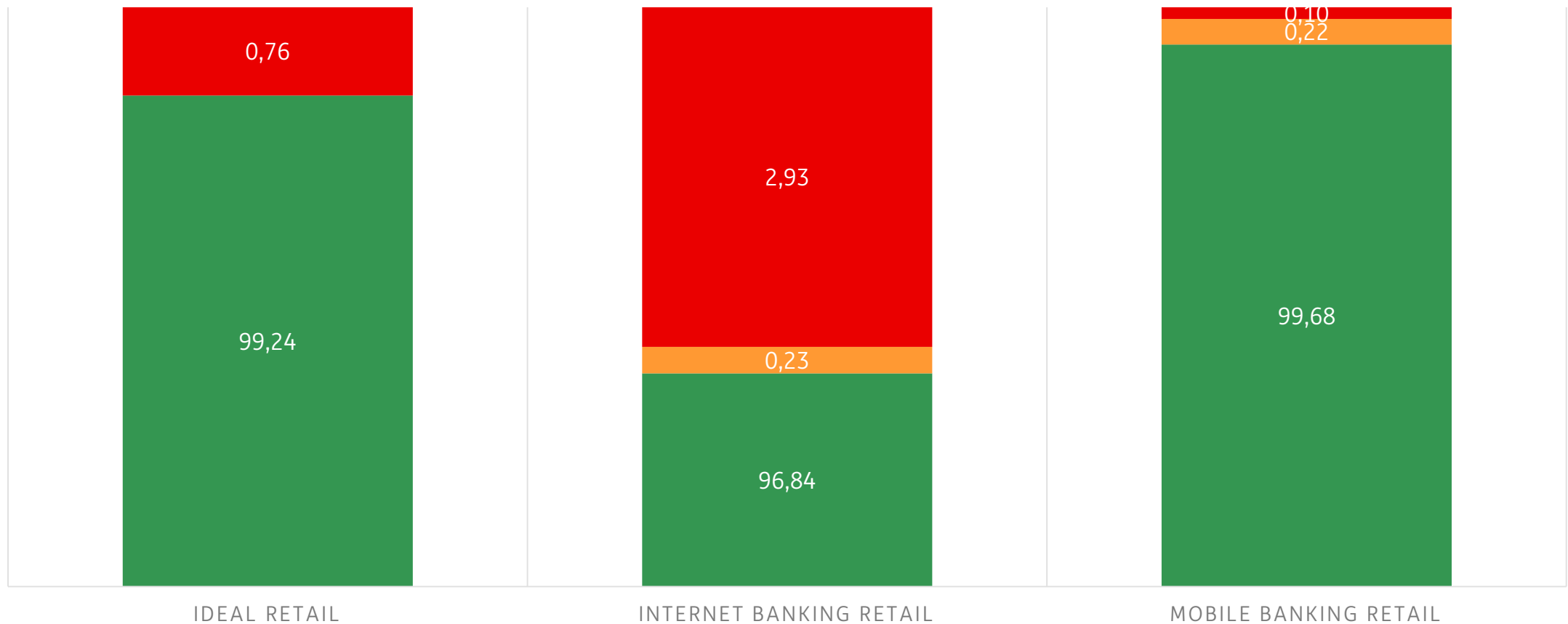
**Internet Banking** used by 6.1 million customers who jointly log in 1.4 million times a day.

17400 **machines** are spread over 2 data centers and use 14 PB of storage.

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# Why do we need to improve the reliability of our services?



AVAILABILITY REPORT OF JULY 2017

- Availability
- Change
- Incident

IDEAL RETAIL: Availability 99,24 — Incident 0,76

INTERNET BANKING RETAIL: Availability 96,84 — Change 0,23 — Incident 2,93

MOBILE BANKING RETAIL: Availability 99,68 — Change 0,22 — Incident 0,10

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# Why do we consider SRE as the key to improving reliability at ING?

**Future of banks is not as we know them today**

Technology, changing customer behavior, new competition and regulation are driving a transformation in the banking industry. Customers expect a real-time digital banking experience that's available 24/7.
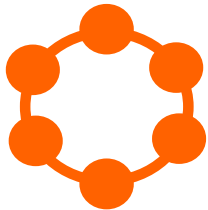
**To match customer expectations, we work in end-to-end Agile BizDevOps squads**

Teams are autonomous, there are fewer handovers and there's a different take on management.

**We celebrate an engineering culture where we solve problems with IT: reliability included**

Over the years IT has become more important within ING. We are building an engineering culture where there's room and time for automation, innovation, autonomy and a lot of engineering. To improve our reliability we needed an approach that fits with these ideals: SRE seems to be the answer.

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**Within the Domestic Bank, we have adopted the Spotify model and we work in Tribes composed of BizDevOps squads who are responsible for build and run: our SRE team is positioned centrally within the Domestic Bank (Retail NL) as an isolated silo**
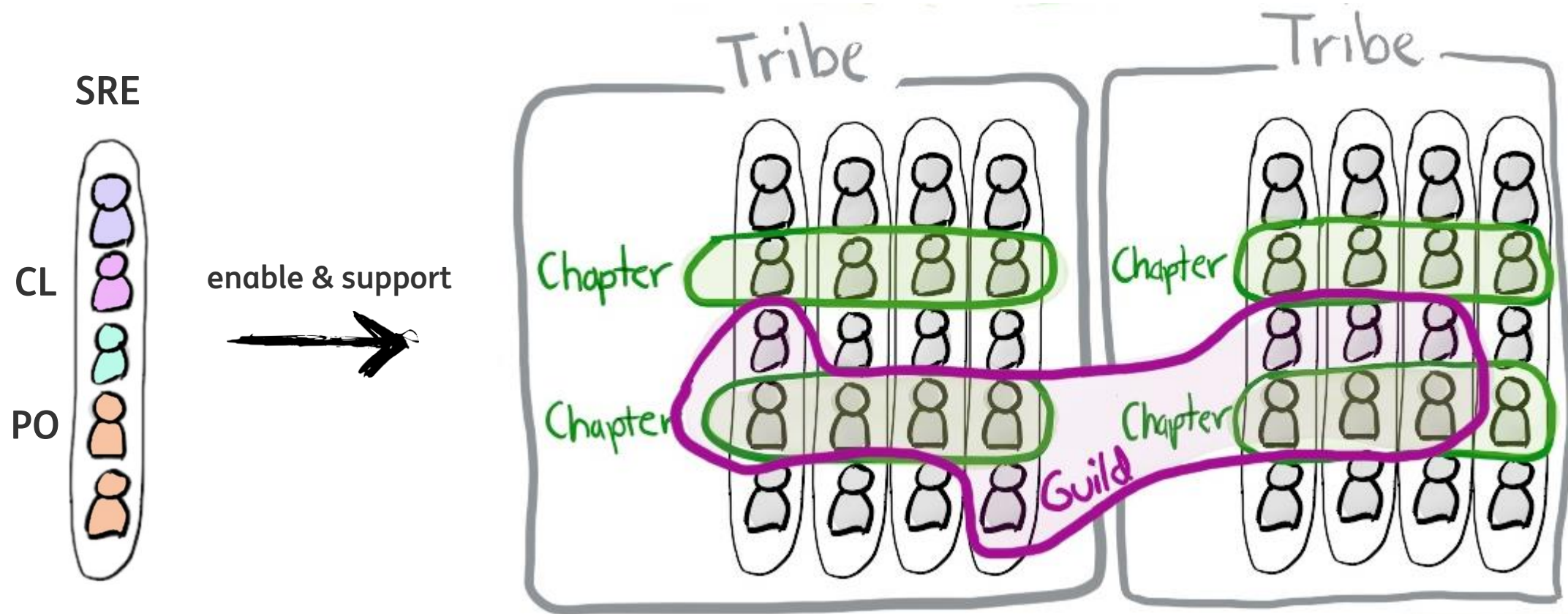
# Within ING we have a number of challenges related to our reliability that we want to solve through SRE

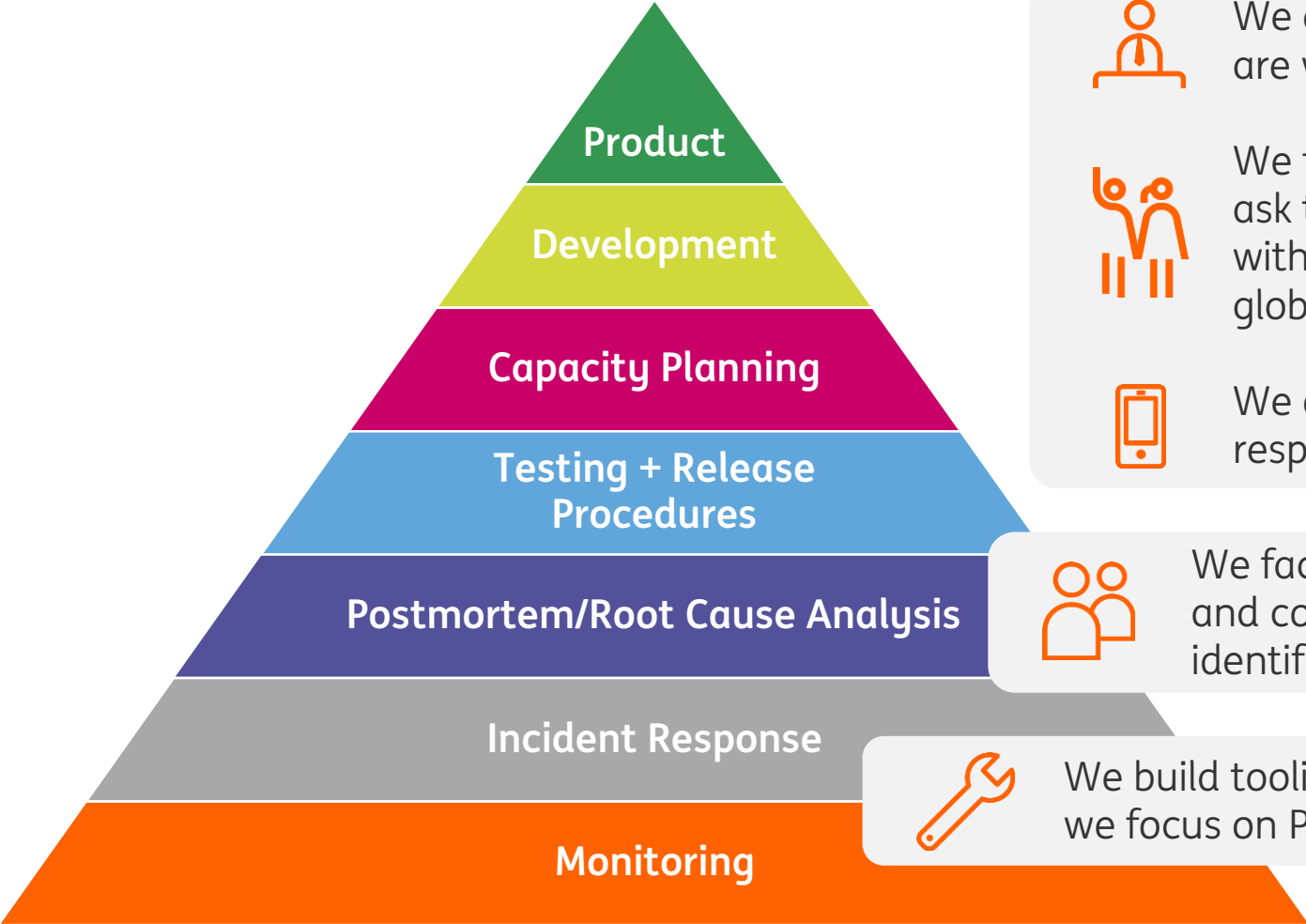| | |
|---|---|
| Our centralized monitoring solutions sometimes encounter scalability and availability issues. | Teams are not in control of monitoring solutions and cannot fix it when broken. |
| Our centralized alerting solution is unreliable and does not send alerts directly to BizDevOps teams. | It takes too long for an alert to reach the right team: on average we need 69 minutes before an engineer starts working an incident resolution. |
| The same incidents occur multiple times and we do not follow up on incidents enough. | We do not learn enough from mistakes made – we have yet to become a learning organization. |
| In a global IT organization we need a way to collaborate during incident response. | Engineers from different countries have difficulty communicating on shared platforms. Our way of working during major incidents is location-driven. |
| Teams do not always measure availability from a white box monitoring perspective. | Teams are not always aware of their services' performance and cannot take full responsibility for run. |

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# Our SRE team enables engineering teams through delivery of tooling, facilitation, consulting and education

**Product**

**Development**

**Capacity Planning**

**Testing + Release Procedures**

**Postmortem/Root Cause Analysis**

**Incident Response**

**Monitoring**

We educate others about SRE during demos and are working on developing training materials.

We facilitate the creation of more SRE teams and ask them to join our SRE community meetings with the other NL-based SRE teams and our global online SRE community.

We are not on call: BizDevOps teams are responsible for their own build and run.

We facilitate BizDevOps squads during post mortems and consult whenever our help is needed in fixing or identifying reliability issues.
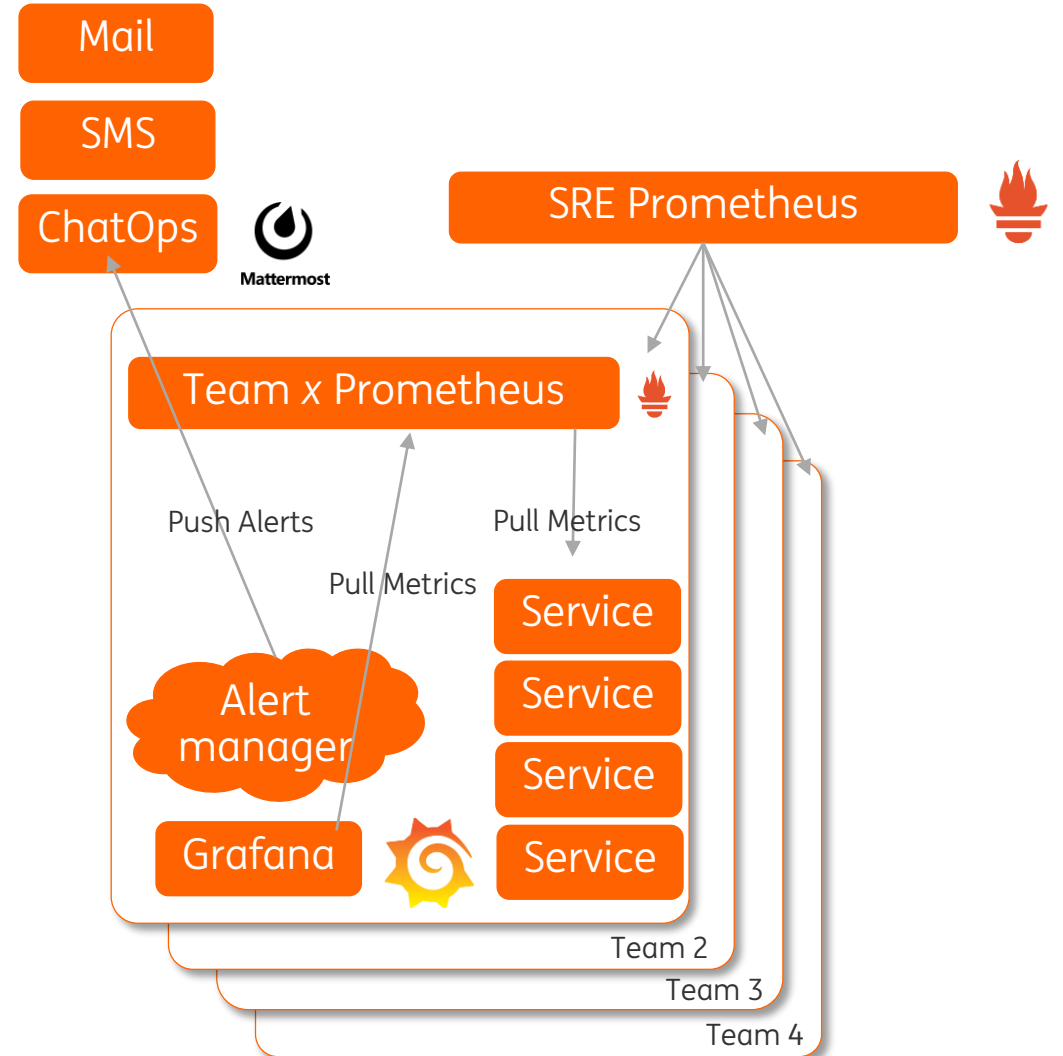
We build tooling to enable BizDevOps squads. At the moment we focus on Prometheus and Mattermost (ChatOps).

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# Other SRE teams' work can be plotted on this hierarchy in a similar way

Product

Development

Capacity Planning

Testing + Release Procedures

Postmortem/Root Cause Analysis

Incident Response

Monitoring

Again, other SRE teams also do demos and share their stories within their organization. All SRE teams participate in local and global communities.

SREs at our Infrastructure department are looking into growing our chaos engineering capabilities. SREs at Wholesale Bank are working on open source license and vulnerability scanning with Black Duck.

Our colleagues at the Wholesale Bank and Infra are working on an alert transporter based on Openduty (open source version of Pagerduty).

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# We aim to reduce our time to repair through tooling by improving our monitoring with Prometheus and introducing ChatOps with MatterMost

SRE takes care of provisioning machines, continuous delivery pipeline, maintaining binaries and generic configuration while taking away administrative toil from BizDevOps teams.

Mail

SMS

ChatOps

**Mattermost**

SRE Prometheus

Team *x* Prometheus

**Maven™**

**Jenkins**

NOLIO

**Version control**

**Build**

**Deploy**

Push Alerts

Pull Metrics

Pull Metrics

Service

Service

Service

Service

Alert manager

Grafana

**Configure**

**Publish**

Jinja

Team 2

Team 3

Team 4

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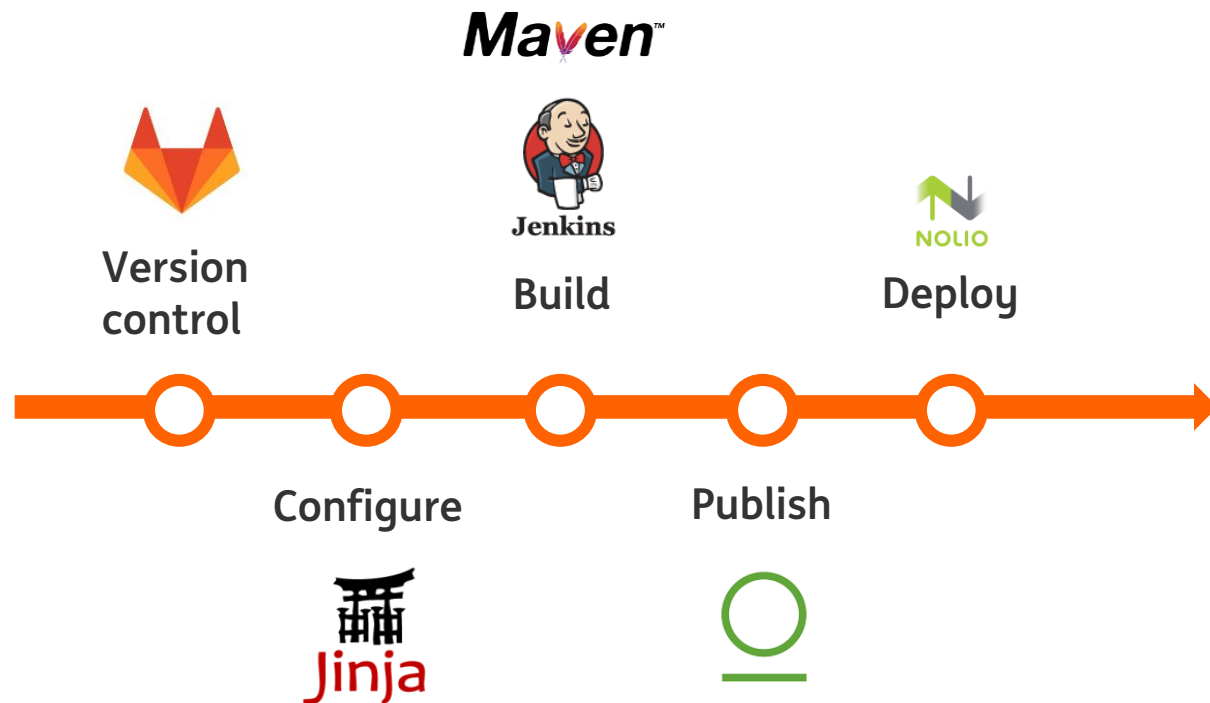
# The purpose of our SRE team is clear, but how did we get there?

**March 2016**: End of Chain Management Internet team (engineers on call for all online channels): maybe SRE is the solution? Let's do a pilot!

**October - November 2016**: Creation of roadmap and vision, new product owner, new chapter lead. Started work on Prometheus and doing postmortems.

**Summer 2017**: Spreading the word about SRE, creating more communication and training materials, figuring out how to scale and making Prometheus production ready.

**September 2016**: End of SRE pilot phase, transition of on call duties to BizDevOps, visit SRECon EMEA 16 as a team, senior management commitment in continuation.

**February - April 2017**: Started work on ChatOps, started local SRE guild for collaboration in NL, started global SRE collaboration workshops, expanded team with 1 SRE.

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# Takeaways

## People

- Never compromise on mindset in hiring SREs.
- Assign a PO to protect team focus on engineering and to spread the SRE love.
- Consider what mix works well for you in terms of new and existing hires: benefit of hiring internally is proof of mindset and respect with engineers.

## Process

- Create a roadmap as a team.
- Learn from others through online resources, at conferences or company visits.
- Prepare to spend time on explaining and promoting SRE and your tooling.
- Beer o'clock is great for team bonding.

## Technology

- Make it attractive for others to use your tooling: take away the pain for teams.
- Practice what you preach: don't take security or reliability shortcuts.
- Productization takes time, a lot of time.
- Consider scalability and ownership when choosing to develop centralized or decentralized tooling.

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