Engineering empathy

Adapting software engineering principles and process to security

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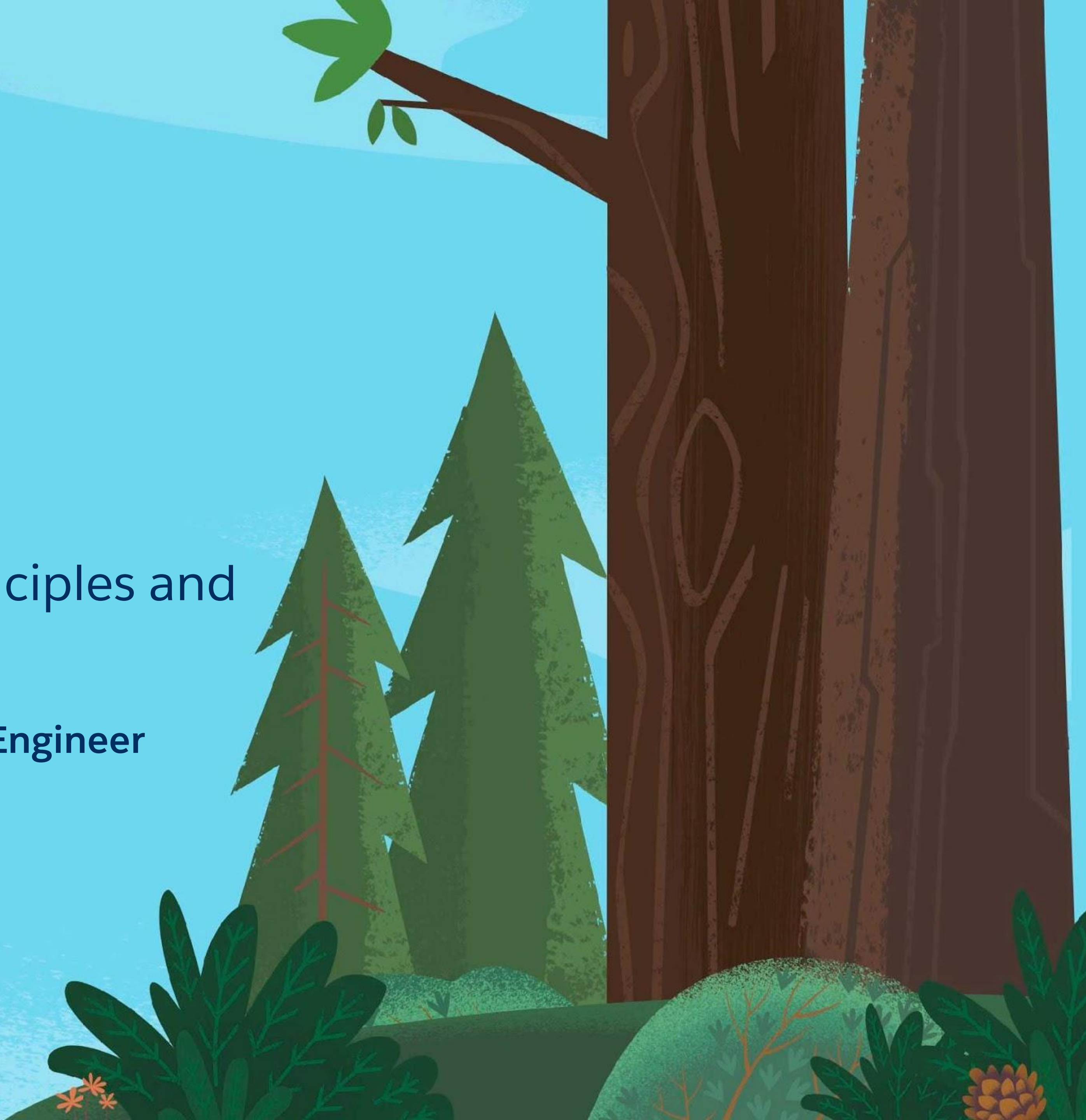

Who are we?

Camille Mackinnon

Principal Infrastructure engineer

Craig Ingram

Principal Security engineer

Learning from software engineers

Everyday principles behind writing good code

How software engineers plan their work and processes

Devops culture

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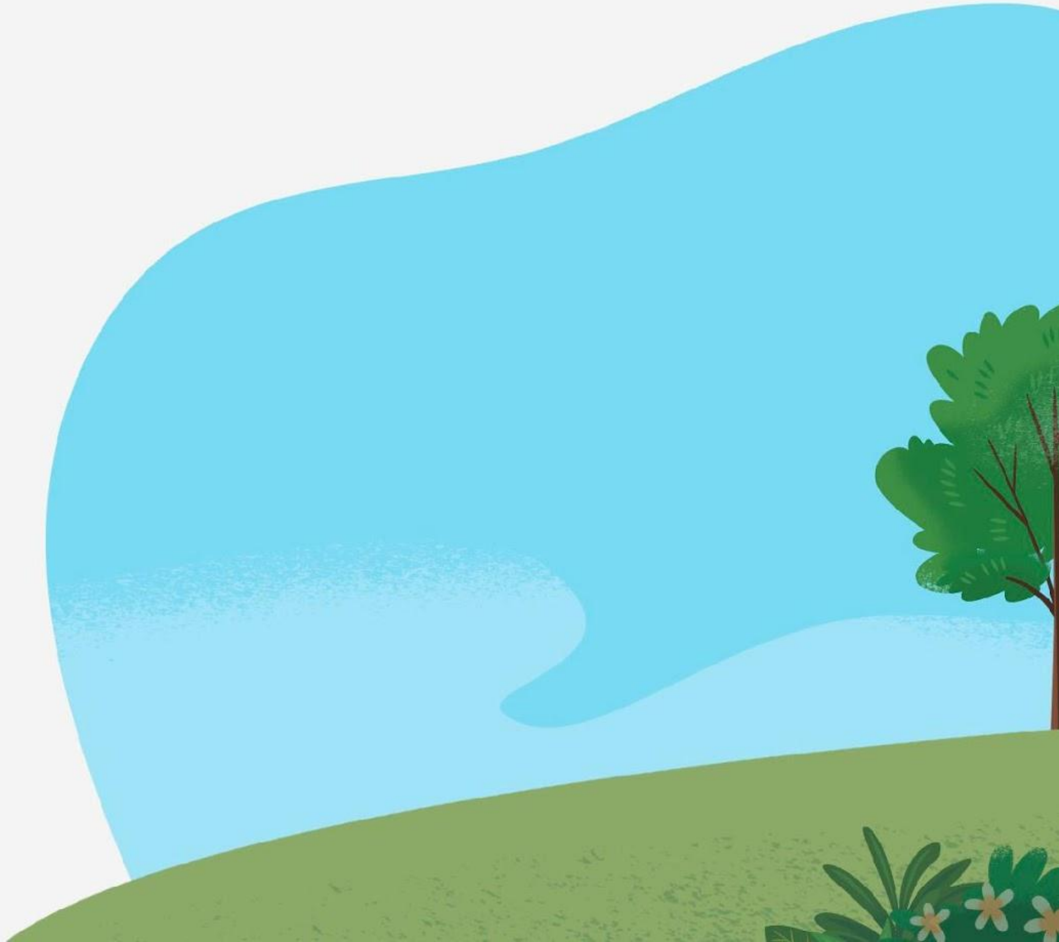
Software design principles

KISS (Keep it Small and Simple)

DRY (Don’t Repeat Yourself)

TDD (Test-Driven Development)



KISS (Keep it Small and Simple)

Keep recommandations simple and straightforward

Try giving your engineering partners actionable clarity

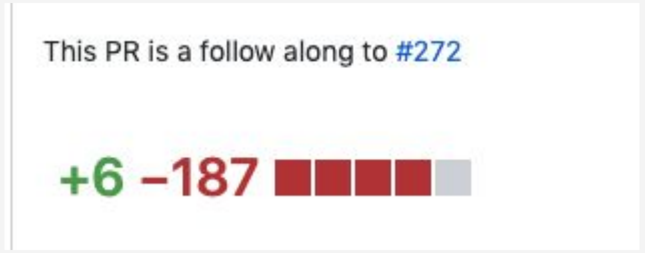
KISS (Keep it Small and Simple)

Not just simple, but also as easy as possible to execute

Keeping things simple for the engineers may mean more work for you in the short term

DRY (Don’t Repeat Yourself)

Reduce repetition of software patterns


This PR is a follow along to #272

+6 −187 🟥🟥🟥🟥⬜

Modification of one element does not require a change in other unrelated elements

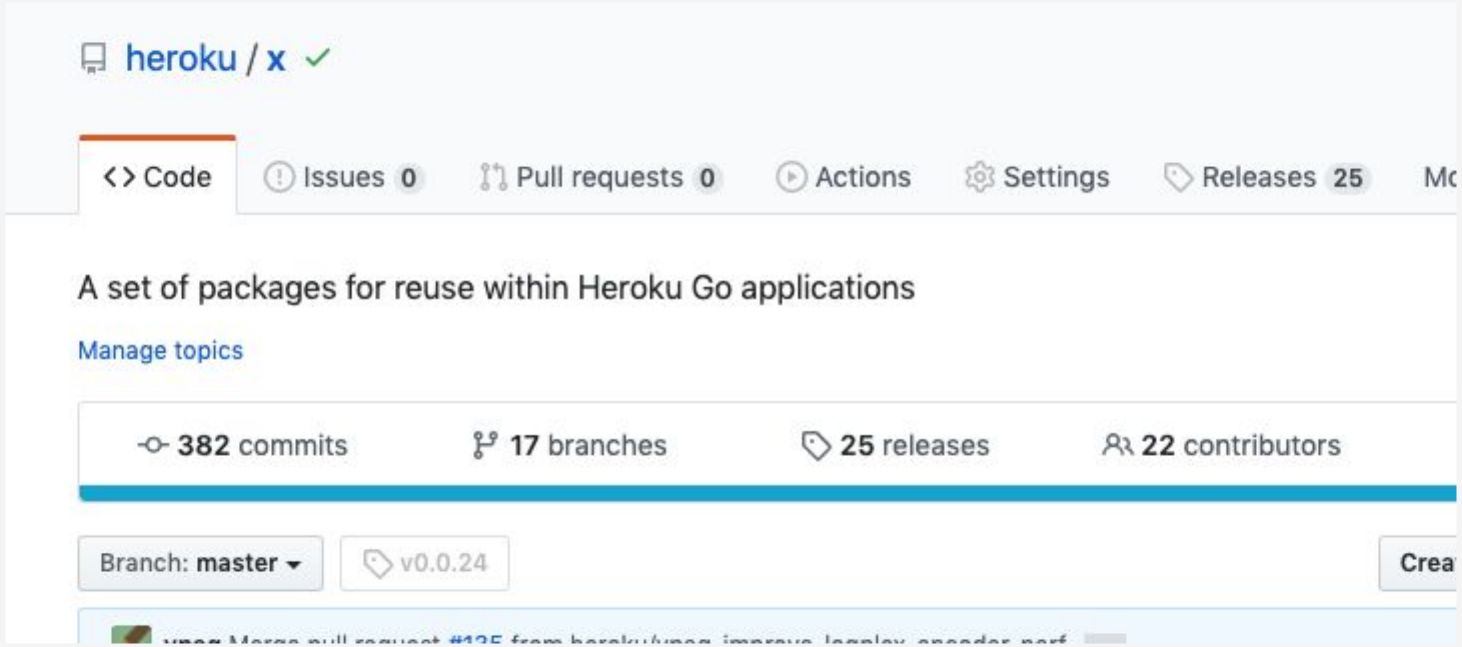
DRY (Don’t Repeat Yourself)

Similar findings, in multiple places in a code base

The same security findings, again and again - why?

DRY (Don’t Repeat Yourself)

Give engineering teams the correct libraries and abstractions to build with


heroku / x

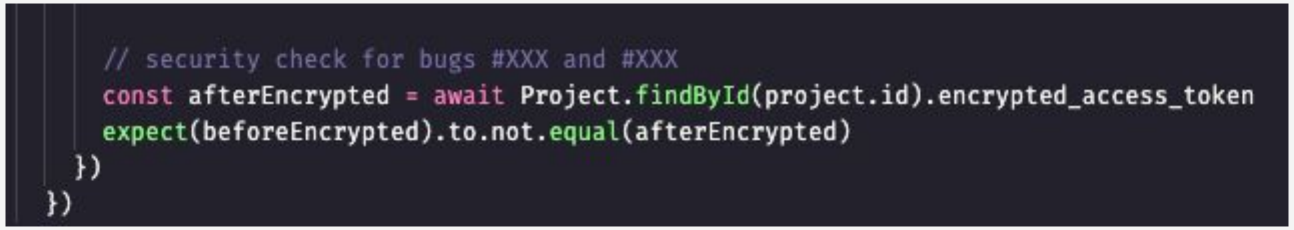
A set of packages for reuse within Heroku Go applications

382 commits 17 branches 25 releases 22 contributors

TDD (Test-Driven Development)

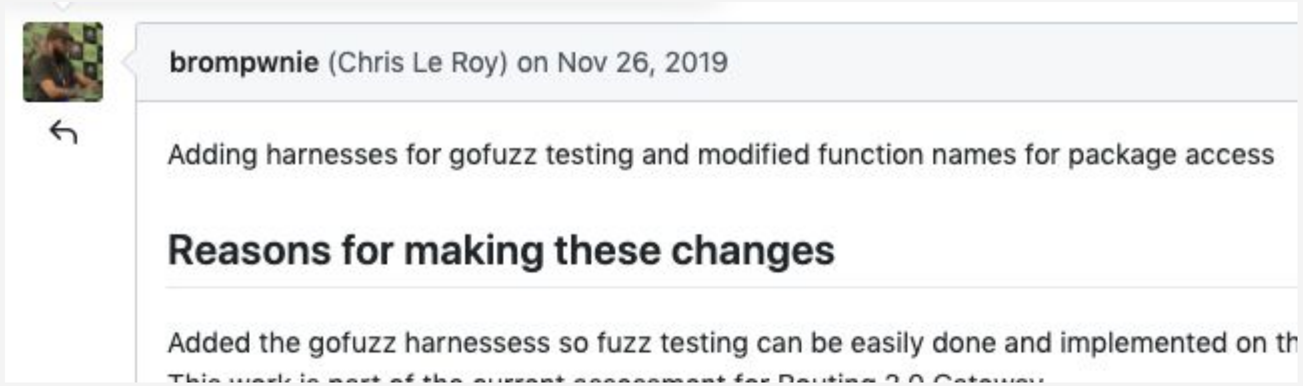
Start with failure

Prevent regressions by putting automated tests in place with patches



```
    // security check for bugs #XXX and #XXX
    const afterEncrypted = await Project.findById(project.id).encrypted_access_token
    expect(beforeEncrypted).to.not.equal(afterEncrypted)
  })
})
```

Integrate fuzz testing with a project that re-finds your bug(s)



brompwnie (Chris Le Roy) on Nov 26, 2019

Adding harnesses for gofuzz testing and modified function names for package access

Reasons for making these changes

Added the gofuzz harnessess so fuzz testing can be easily done and implemented on th

This work is part of the current assessment for Routing 2.0 Gateway

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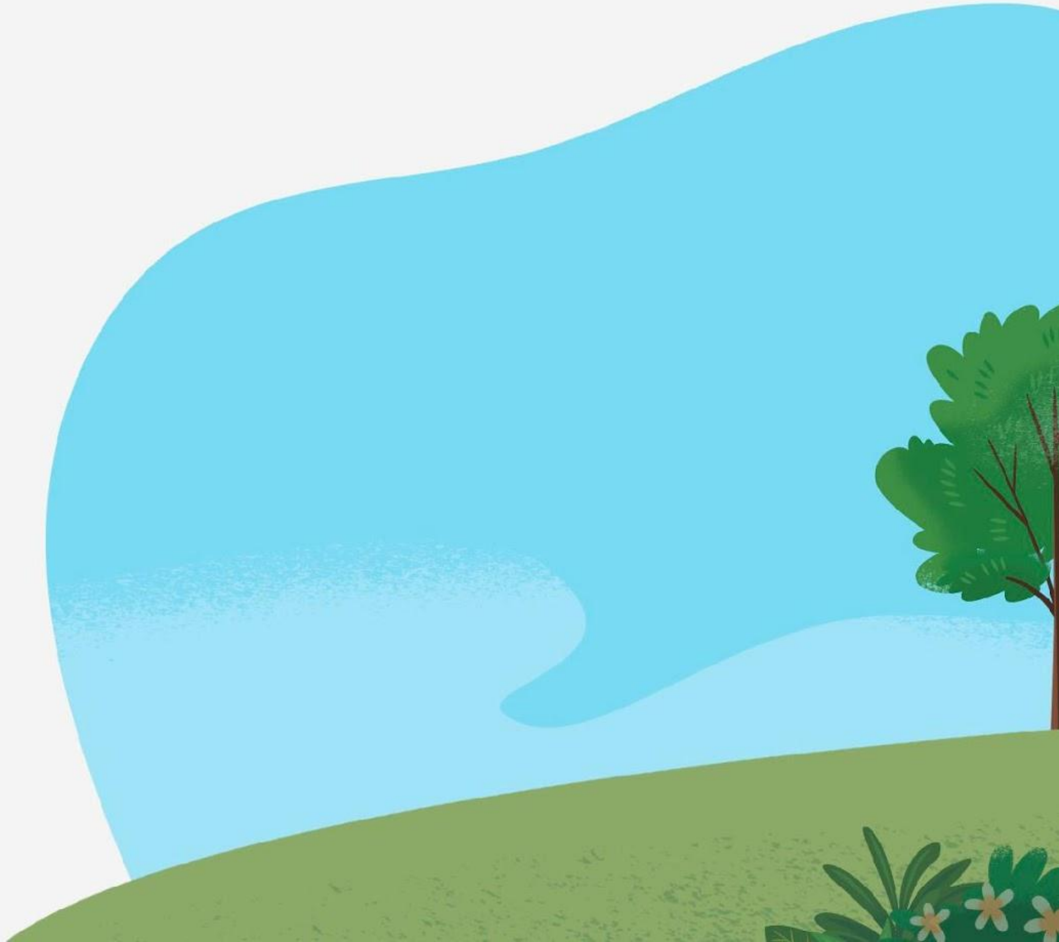
Software engineering processes

Prioritization and planning

Retrospectives

User research



Prioritization, work and capacity planning

Engineering teams need to prioritize amid many competing aspects of their work:

- new features customers need
- performance and scalability
- security!
- long term architectural changes

Prioritization, work and capacity planning

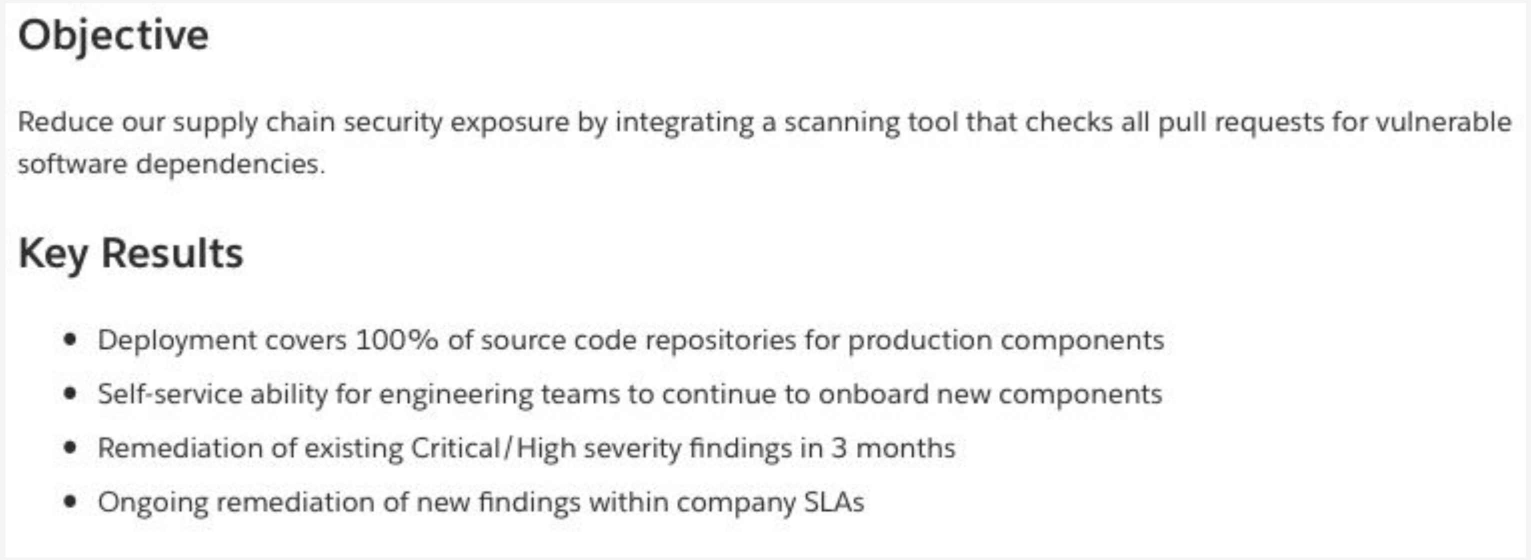
Balance:

- security assessments (audit deadlines, engineering deadline)
- tool development
- deeper research

Prioritization, work and capacity planning

Ruthless prioritization

Clear objectives and key results (OKRs)



Objective

Reduce our supply chain security exposure by integrating a scanning tool that checks all pull requests for vulnerable software dependencies.

Key Results

- Deployment covers 100% of source code repositories for production components
- Self-service ability for engineering teams to continue to onboard new components
- Remediation of existing Critical/High severity findings in 3 months
- Ongoing remediation of new findings within company SLAs

Retrospectives

Engineering teams run retrospectives for:

- their sprints
- major downtime incidents

Blame-free, identify steps forward

Retrospectives

Even without sprints, taking time to identify as a team if we are making the progress we want is important

Security incidents, major bugs found after release, security flaws in architecture can all benefit from a retrospective

Customer interviews, user research

Engineering teams rely on product managers, user researches or themselves to figure out if they are building the **right** thing. They:

- do customers interviews or user research
- develop user personas to understand their users' needs

Customer interviews, user research

Listen to your engineers and understand what they are asking

Observe what your engineers are doing and what that can tell you about their needs

Customer interviews, user research

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Customer interviews, user research

An engineer trying to work around security controls can tell you a lot about solutions you need to provide them.

Understanding your engineering team's needs means that recommendations are more likely to be followed

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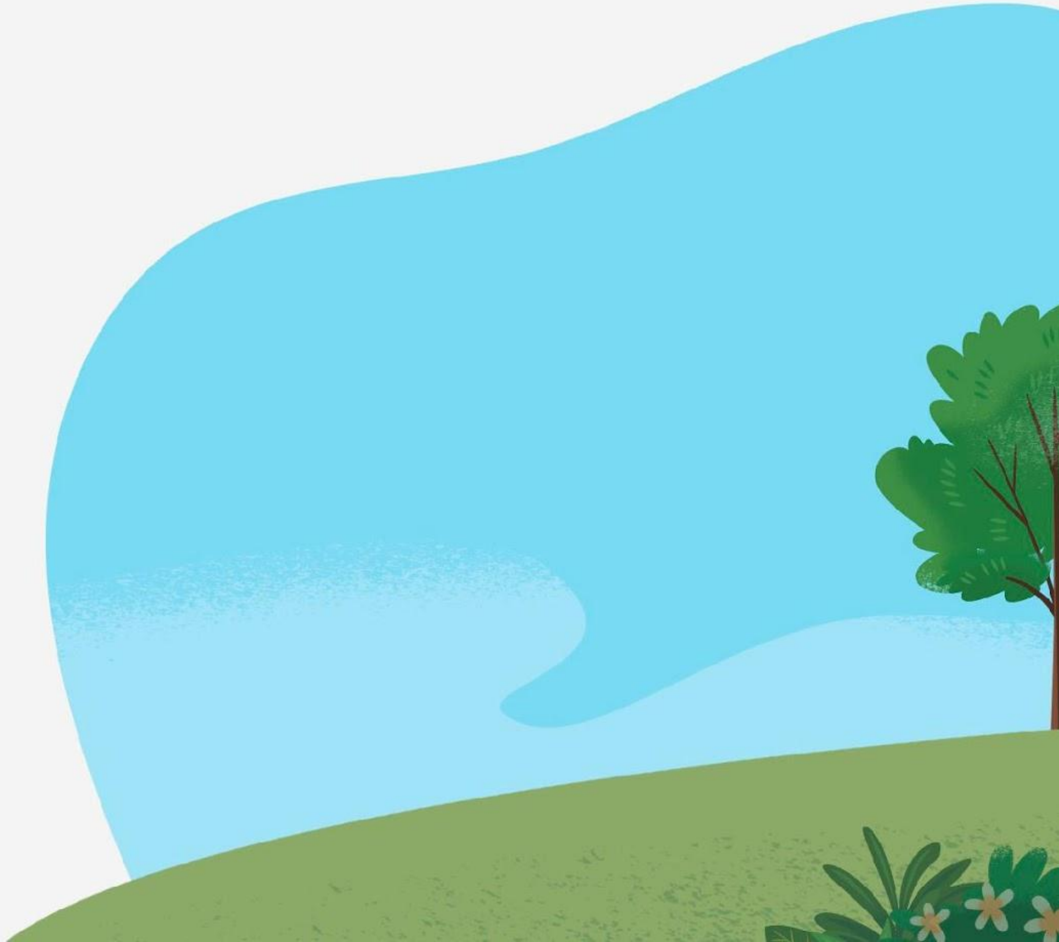
Devops culture and organizational changes

Devops culture and Organizational level changes

Measures: SLOs, SLIs

Remove toil through automation

Shifting left



Measures: SLOs, SLIs

Service level objectives and indicators

Actions are taken when indicators reach certain levels

Measures: SLOs, SLIs

Service level indicators for infosec:

- last time each team has asked for a security review
- last time your threat models have been updated
- pull request failure rates due to automated security tools

Remove toil through automation

Toil: manual, repetitive, automatable, reactive, lacks enduring value, grows at least as fast as its source

Integrate with engineers' own efforts to automate: see what tools they are using and how to leverage them to automate security work as well

Shifting left

Be a part of the early planning and design decisions

Adapt to the environment you are in

Build tools and automation that works with what teams are already using

Conclusion

Look at your software engineering teams to improve your security team

Develop empathy by understanding their constraints and competing priorities

Share in their culture to work more closely together and provide better security solutions

Thank You