Google

How Google SRE and developers work together

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Site Reliability Engineering

2+ billion
lines of code

Google's production
environment might be one of
the most complex integrated
systems humanity ever
created.

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How to run a planet-scale system?

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Reliability   Velocity

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We need specialists to design and run our systems

Reliability

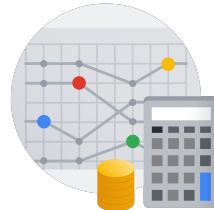Meet the availability targets the users need.

Velocity

Maximize the long-term feature velocity.

Maintainability

Use software rather than human toil.

Efficiency

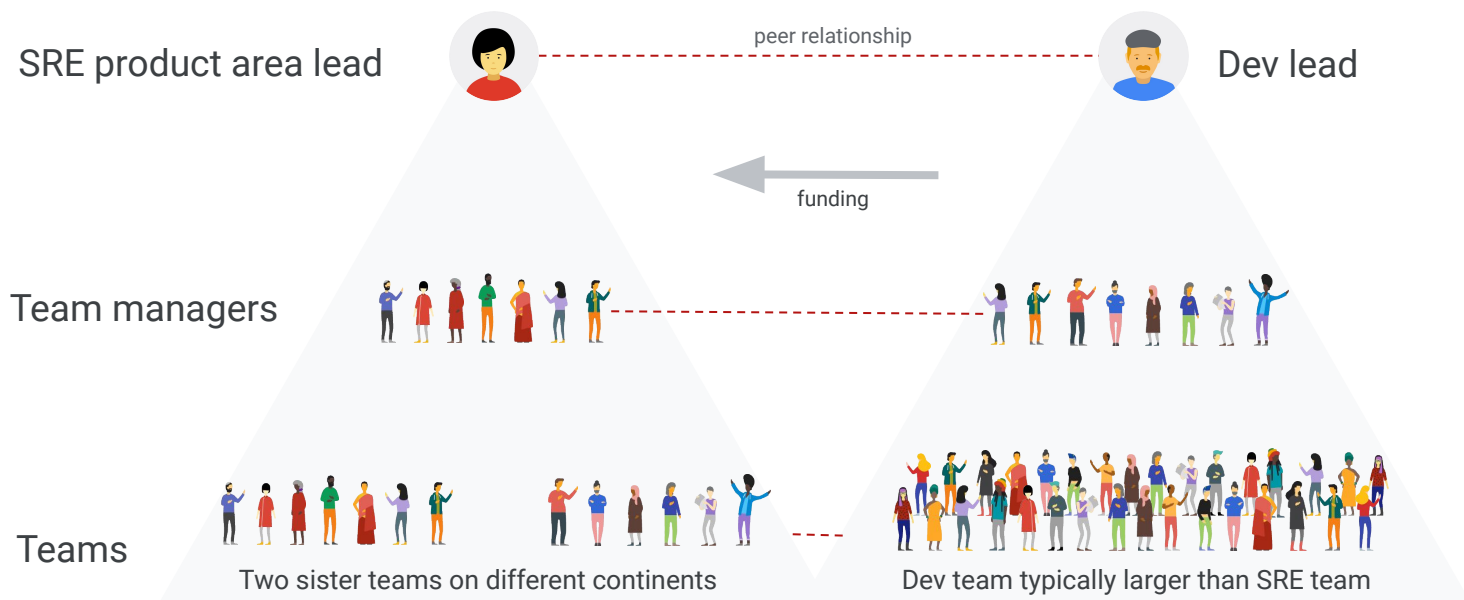Use engineering time and machine resources efficiently.

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" SRE is what happens when you ask a software engineer to design and run operations. "

Benjamin Treynor Sloss, Vice President of 24x7 Engineering, *Google*

Google

SRE is its own organization that partners with Dev

SRE product area lead   peer relationship   Dev lead

funding

Team managers

Teams

Two sister teams on different continents   Dev team typically larger than SRE team

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The SRE Engagement Model

SRE support is not automatic

Funding

SRE teams are funded by Dev. It's their choice whether to invest in SRE or not. Once transferred SRE has responsibility for that headcount.

Strategic Partnership

Production excellence is a long-term investment. Engagements are not considered in isolation but at the SRE product area level.

Dev Ownership

The service itself and its reliability is ultimately owned by the Dev team, even if day-to-day production authority rests with SRE. Responsibility for having a reliable service is not off-loaded onto the SRE team.

Consensual Partnership

Starting and continuing with an SRE engagement is a joint decision for Dev and SRE.

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What should SRE work on?

Align with SRE's mission

- Reliability
- Velocity
- Maintainability
- Efficiency

Clear value proposition

SRE should only take on work that SRE can do significantly more efficiently than anyone else. The work must also be impactful, interesting, and challenging for the SRE team.

SRE is not an "ops team"

SRE's mission is not to handle operations, but to improve the inherent reliability of systems through engineering.

Ops is not a zero-sum game

Instead of moving operational responsibilities from one place to another, an SRE engagement should focus on reducing overall ops workload.

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How to find the most impactful work?

Shared Endeavor

SRE and Dev bring different expertise, the success of a service is a shared endeavor. Both sides work towards a common goal.

Success must be tracked

SRE and Dev maintain a shared roadmap and track progress towards goals. They regularly review service health and priority.

SLOs and Error Budgets

Use of SLOs and error budgets promotes a common understanding of reliability goals and an objective tool to measure success.

Adjust investments

Engagements and their funding should be regularly reviewed. Headcount should be allocated to the most impactful work.

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Focus on the important stuff

Clear scope

SRE teams should be scoped to a set of services with clear correlation and boundaries.

Advocate for the user

SRE is an advocate for the user and for the user's experience (e.g. end-to-end and customer centric SLOs).

Promote convergence

Standardized production platforms reduce the cost of implementing horizontals, operating services, and moving them between teams.
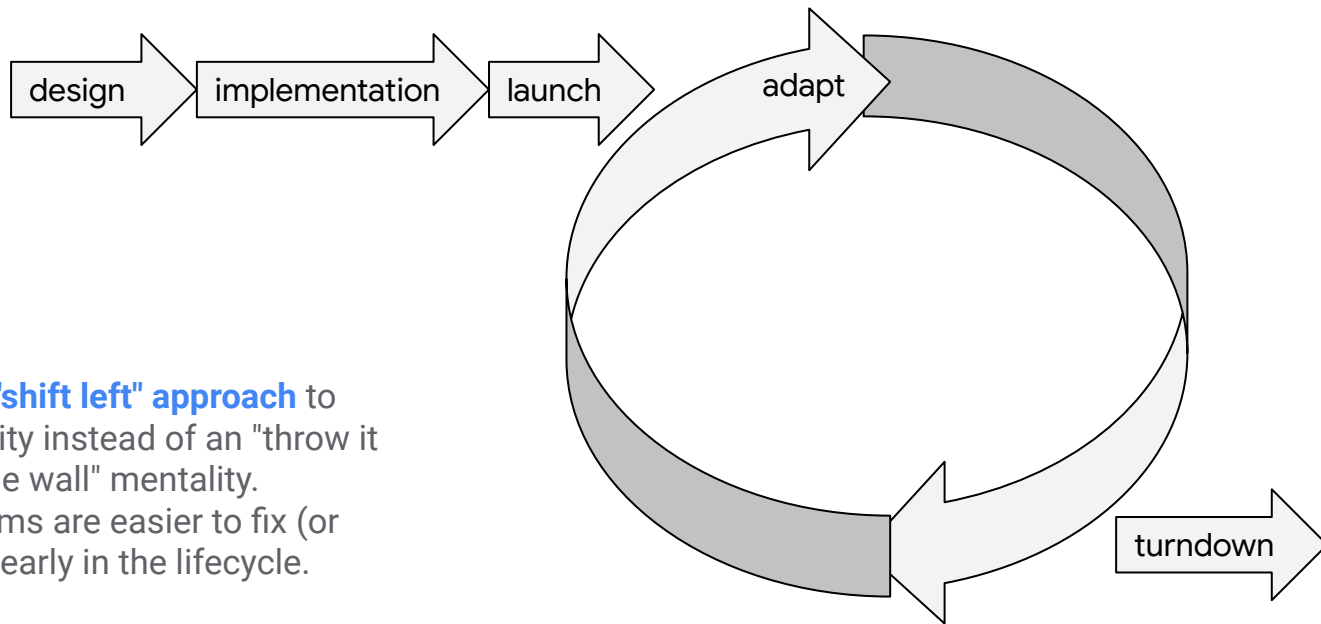
Teach to fish

SRE should not serve as a human abstraction layer for production.

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Engagement Types

Engage throughout the Service Lifecycle

design → implementation → launch → adapt → turndown

Use a **"shift left" approach** to reliability instead of an "throw it over the wall" mentality. Problems are easier to fix (or avoid) early in the lifecycle.

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Baseline
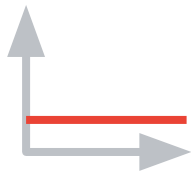
Dev should have access to **base-level, ad-hoc support** when needed. This is the default engagement type in the absence of a specific service engagement type (in which headcount would be a consideration).

SRE office hours or fixed-time **consulting projects** to get production advice and technical design feedback.

Access to an **incident response team (IRT)** for coordinating large-scale outages. Cannot provide service-specific advice, but can help with communication and generic production expertise.

Assisted Engagement

SRE provides strategic, proactive, project-focused consultancy to the Dev team. There is a dedicated **SRE point of contact** for the service and a **shared roadmap** for the production aspects of the service.

Joint projects between SRE and Dev to improve the service health. Production is still owned by Dev, but SRE sometimes participates in a **shared oncall** to get a deeper understanding of the service.

SRE may take on roles such as **co-design, applying reliability expertise and experience**. Such engagement at an early stage (e.g. co-design) is one of the most highly leveraged (and thus valuable) activities SRE can undertake.

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Full Support

Full Support is the **highest commitment** support type, in terms of headcount funding, time investment from the Dev team, and SRE authority over the service.

It typically entails **SRE oncall responsibilities**, and requires a model of **shared ownership** and close coordination between both sides.
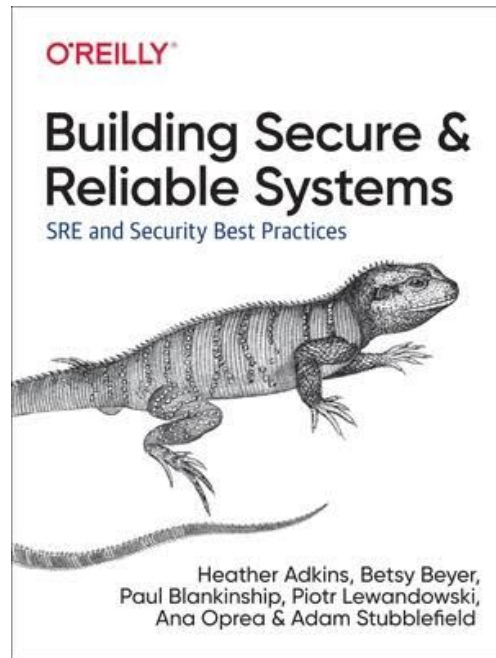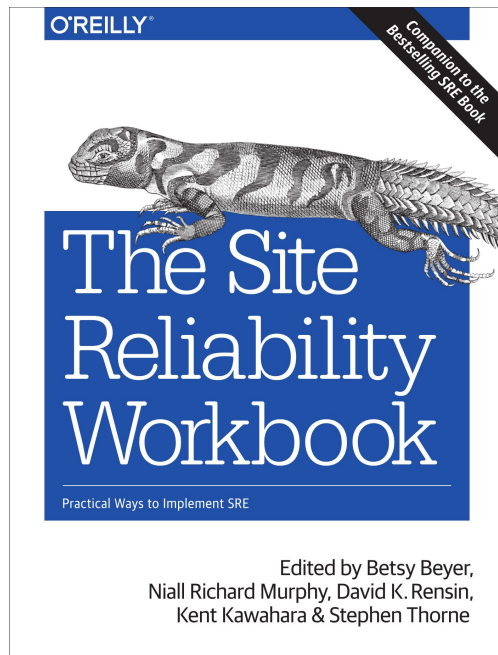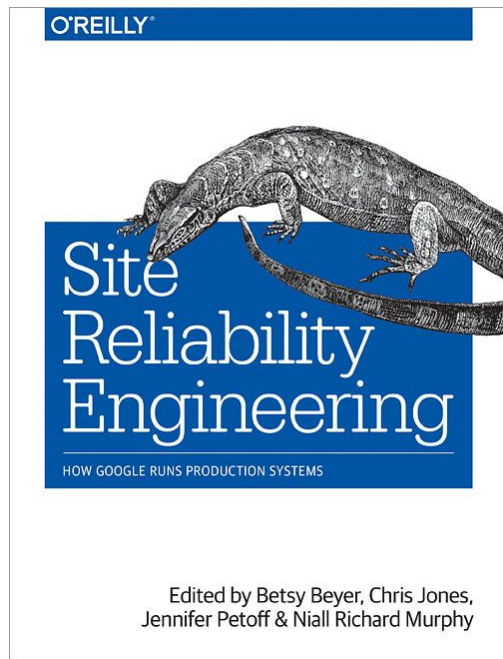
Significant project work from both sides is expected to fully comply with SRE best practices. The focus of this work is to reduce the long-term effort and risk of operating and maintaining the service.

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O'Reilly Books

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