Introduction to Network Reliability Engineering

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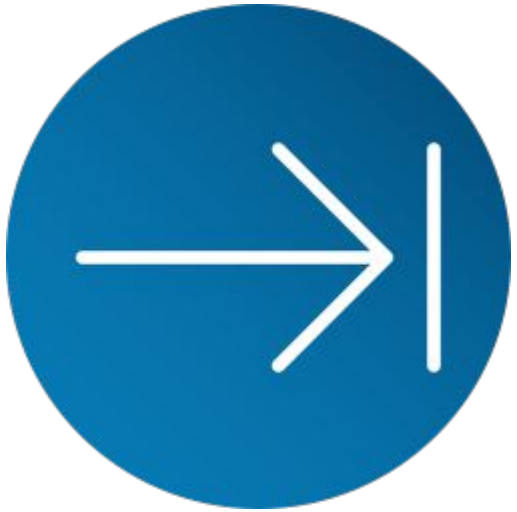
Agenda

1. What is Network Reliability Engineering (NRE)?
2. Five Key NRE Behaviors
3. How to get started with NRE

Origins of Network Reliability Engineering (NRE)

Site Reliability Engineering

Where have we come from?



Traditional

Development/ Operations Bottlenecks

- Department Silo’s
- Slow release cycles
- High toil workloads
- Poor operational visibility

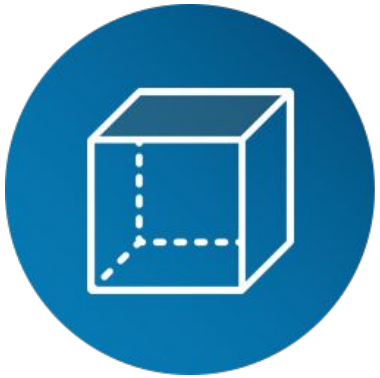
What is Reliability Engineering?

"What happens when a software engineer is tasked with what used to be called operations"

Ben Treynor Sloss

“Helping Product and Engineering deliver the best experience possible for the end user from an operations perspective”

Site Reliability Engineering & DevOps



Reduce

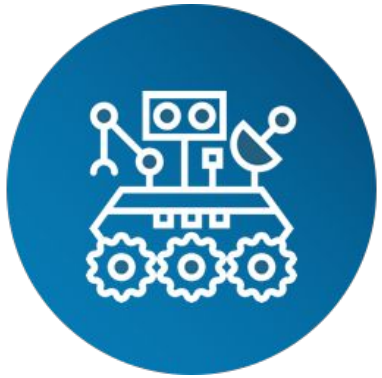
Operational Silos

Accept

Failure as normal

Implement

Gradual changes



Leverage

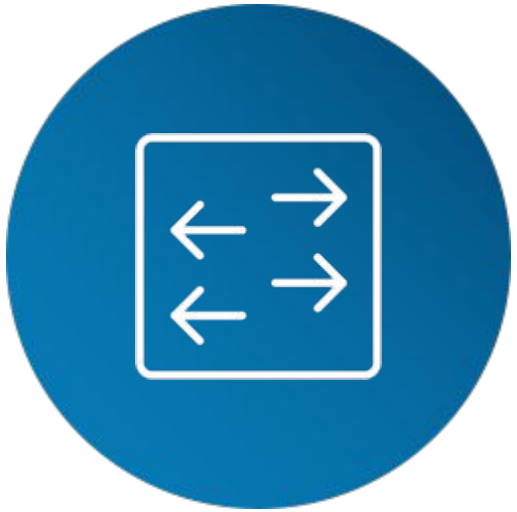
Tooling and automation

Measure

Everything

SRE & Networking

SRE & Networking

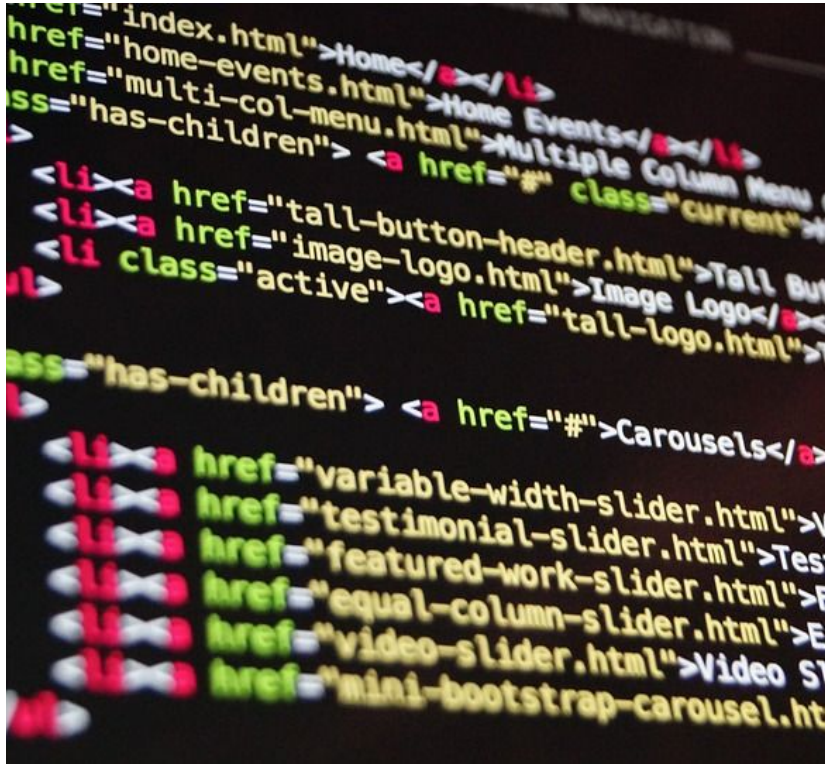


- Networking devices finally have API's
- Network telemetry has evolved
- It is now possible to treat networks as pieces of software infrastructure
- Using a software infrastructure mindset requires a change in the way you run operations

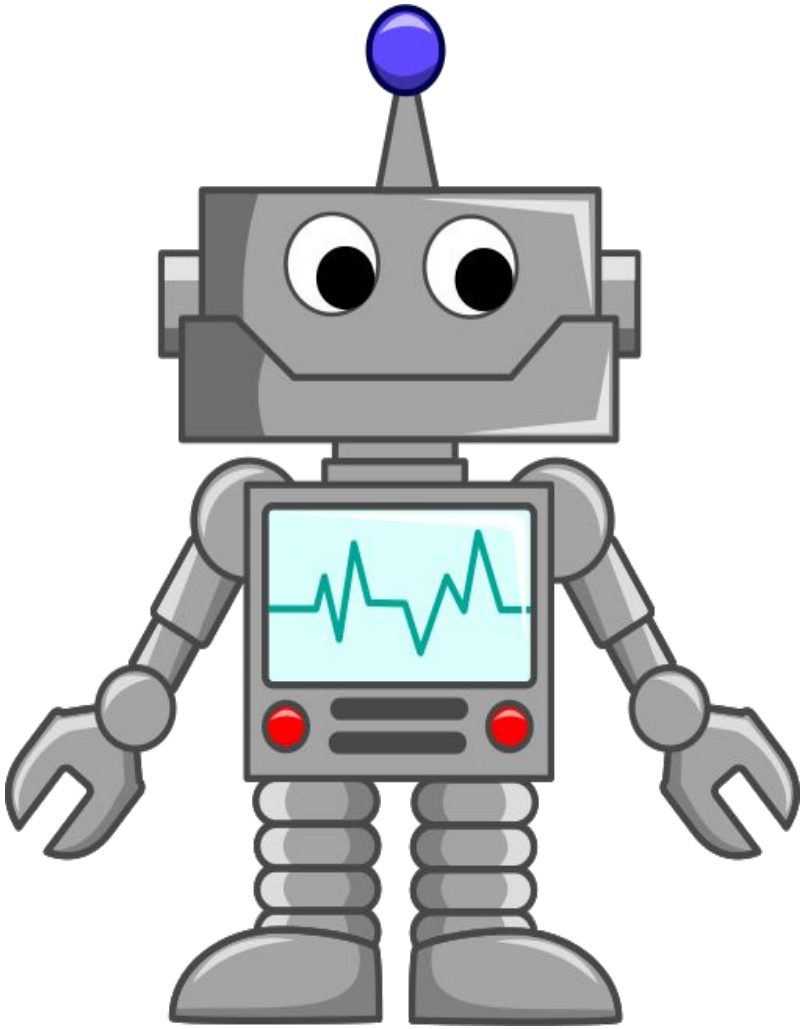
Key Behaviors of a Network Reliability Engineer

Behavior #1 - Codify

- Tribal knowledge is the enemy. Get it out of your head!
- Build competence and inertia around a core set of languages and skills.
- Learn how to compose a solution from existing functional components.



Behavior #2 - Automate



- You can't automate everything. Focus on the highest impact activities.
- Strive for autonomy, not just "scripts".
  - "See something, do something"
- Don't reinvent the wheel. Use an existing framework and build on top of it

Behavior #3 - Test

WISB should equal WIRI

what it should be — what it really is

- Get WISB out of your head and into a test suite.
- **Proactively** assert that WIRI == WISB
- Go up the stack. “Ping” isn’t good enough.
- BONUS: Automated testing helps a LOT with troubleshooting issues.

Behavior #4 - Monitor

- Active/ passing monitoring of network
- Auto-triaging of bad interfaces/ links/ devices
- Leave the “Code” & “Automate” infrastructure to auto-remediate

https://www.eginnovations.com/blog/wp-content/uploads/2018/07/universal-management-pack-scom.jpg

Behavior #5 - Measure

- Measure all aspects of a system:
  - Availability
  - Incident statistics
    - MTBF/ MTTD/ MTTR
  - Disaster recovery
- Chaos Engineering

https://d2x3rgjr0n9rv4.cloudfront.net/2018/05/11141044/How-to-measure-success-of-your-live-video-streams-fb.jpg

How Can I Get Started with NRE?

Getting started
Skill-sets

NRE Labs - a community platform for learning and teaching automation and NRE Principles

- Totally browser-based
- Free, no login required
- Vendor-neutral
- Open Source (curriculum too!)

https://labs.networkreliability.engineering

Getting started
Organizational

- Building relationships is important
- Accountability and blameless culture
- Getting buy-in is important
- It's not "one model fits all"

http://cdn.yourarticlelibrary.com/wp-content/uploads/2013/12/810.jpg

Q&A