# NETWORK RELIABILITY ENGINEERING

## AUTOMATION'S NORTH STAR

Matt Oswalt - @Mierdin
David Gee - @VTEP42

# HEINOUS AUTOMATION LIES

# DO THINGS FASTER

DO THINGS FASTER
NOPE

# FIRE ALL MY CCIES

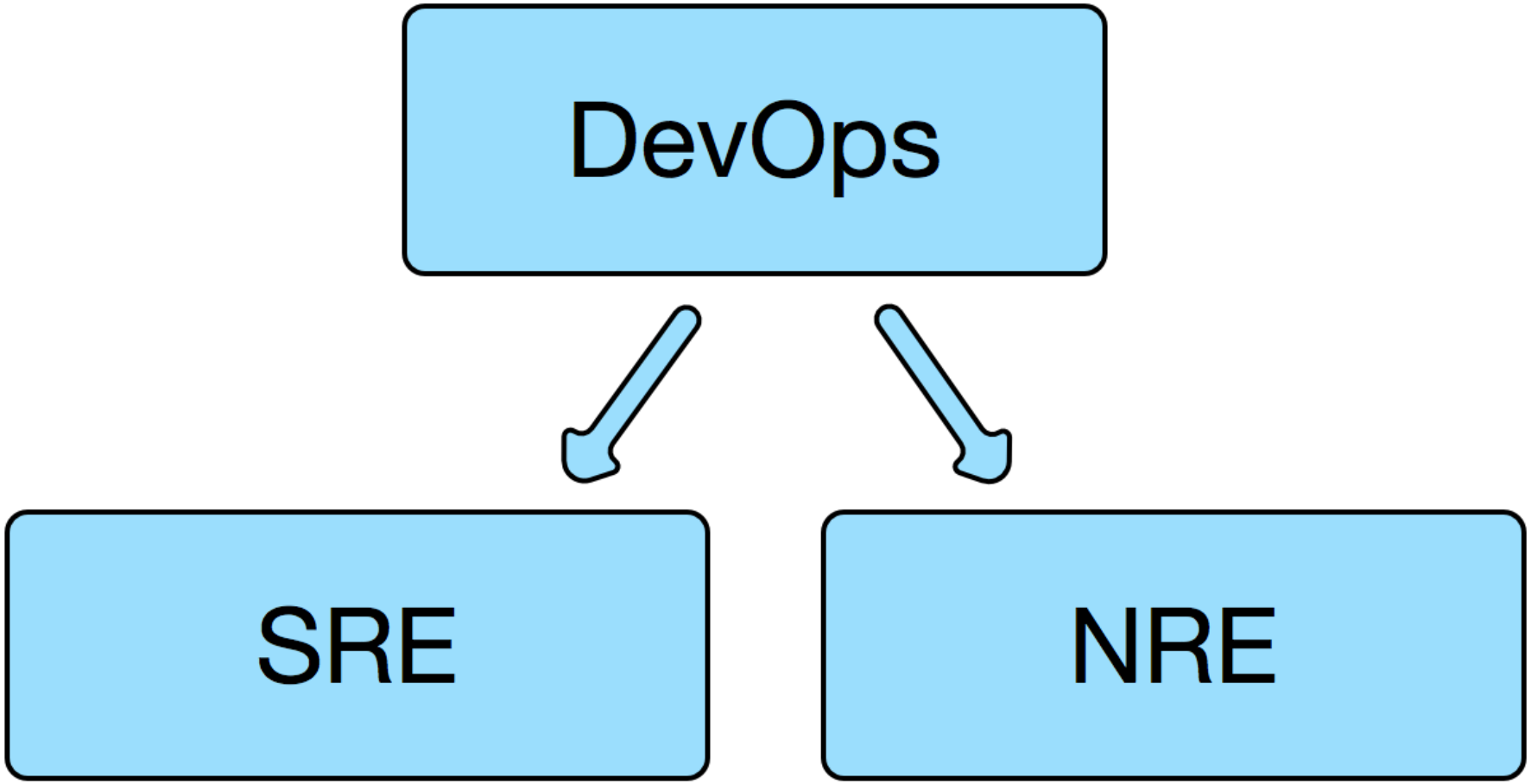
WRONG

AUTOMATION IS ONLY FOR FACEBOOK, GOOGLE, ETC

AUTOMATION IS ONLY
FOR FACEBOOK
GOOGLE, ETC
NUH UH

# AUTOMATION IS JUST OPERATIONS IN MACHINE FORM

# ENTER: NETWORK RELIABILITY ENGINEERING


DevOps
SRE
NRE

**Networking + Speed =**

**Networking + Reliability = Speed**

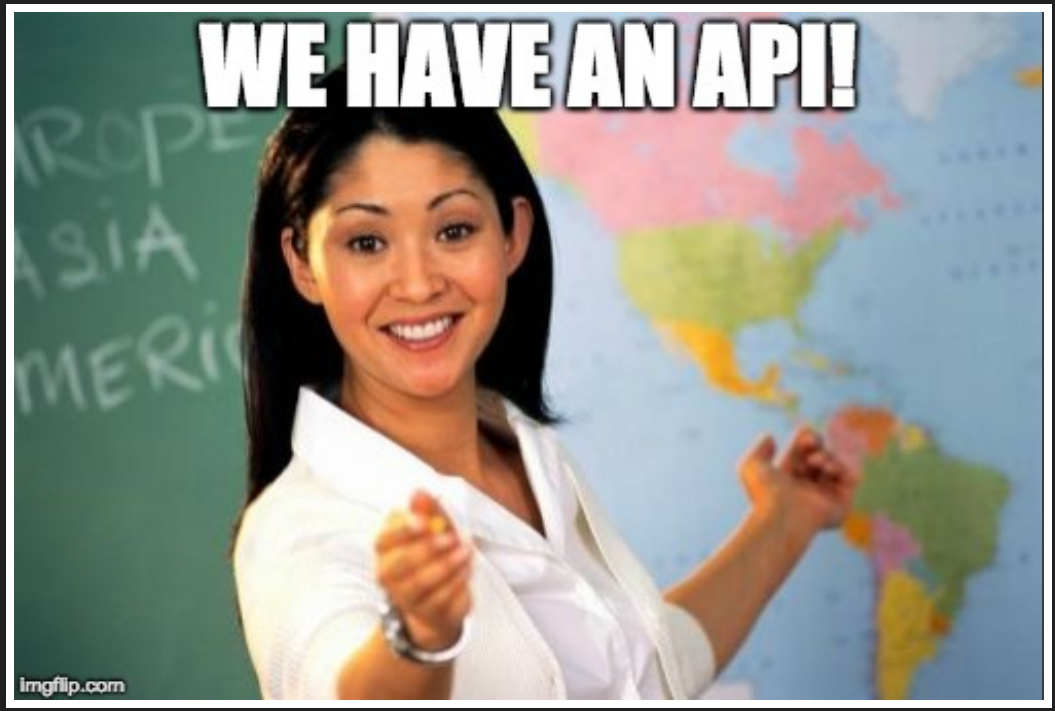
# NRE PRINCIPLES

- Composition
- Outcomes
- Tradeoffs
- Blameless Post-mortems

# THE SEVEN STAGES OF VENDOR ACCEPTANCE

1. I hear you
2. I see your point
3. I understand what you're saying
4. No one has asked for that before
5. I'll see what we can do
6. I'll get back to you
7. It's on the roadmap

(Credit to @ioshints for this genius)


WE HAVE AN API!
imgflip.com

AUTOMATABLE

!=

AUTOMATED

# COMPOSITION: THE "AUTOMATION LAST MILE"

- Not automating everything, but always a day 2 gap
- Composition takes two forms
- AWS knows what they're doing

# OUTCOMES

*What is the ultimate desired outcome for my work?*

# SERVICE HEALTH DASHBOARD

Amazon Web Services » Service Health Dashboard

## Current Status - Jun 17, 2018 PDT

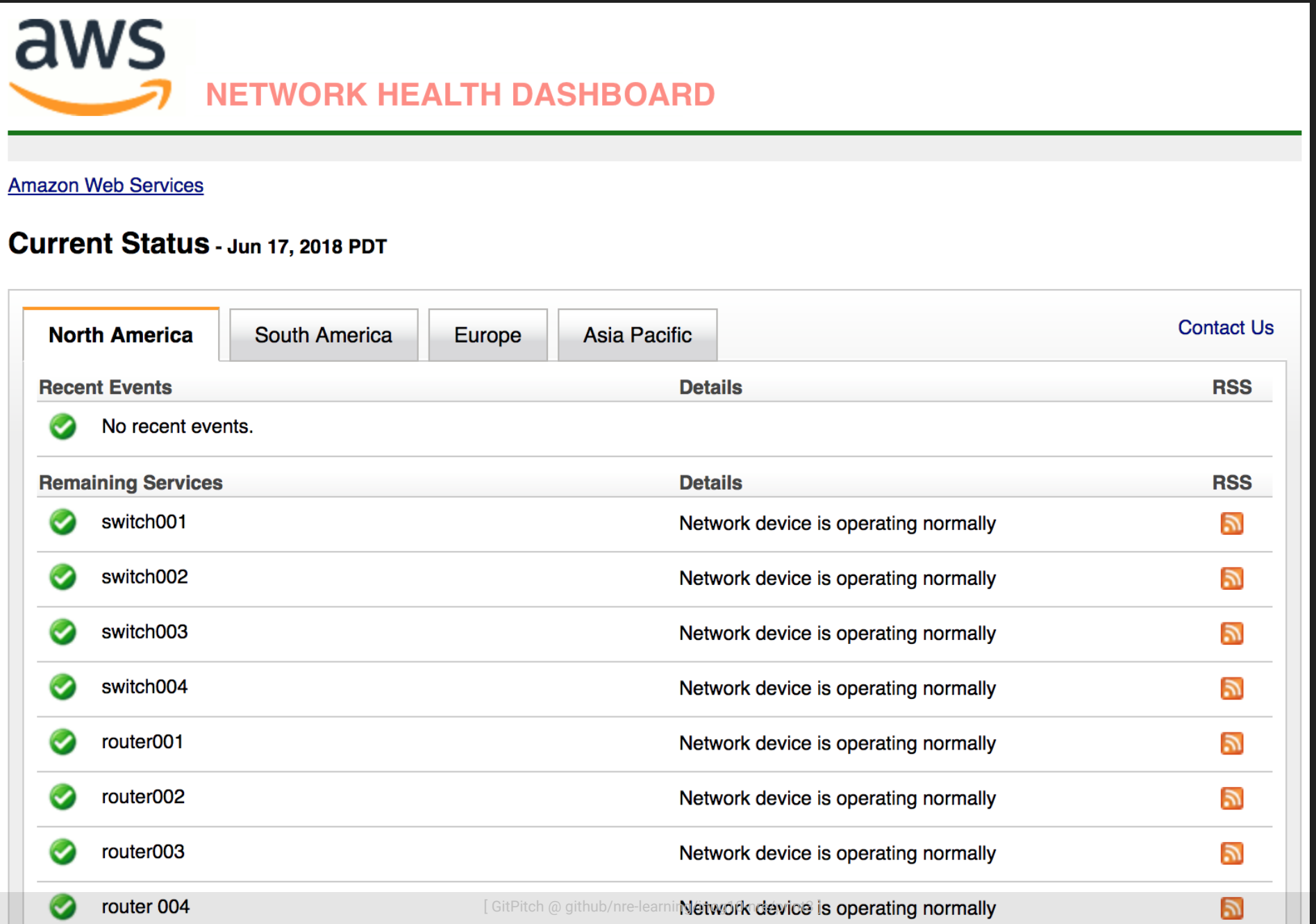
**North America** | South America | Europe | Asia Pacific

Contact Us

| Recent Events | Details | RSS |
|---|---|---|
| No recent events. | | |

| Remaining Services | Details | RSS |
|---|---|---|
| Alexa for Business (N. Virginia) | Service is operating normally | |
| Amazon API Gateway (Montreal) | Service is operating normally | |
| Amazon API Gateway (N. California) | Service is operating normally | |
| Amazon API Gateway (N. Virginia) | Service is operating normally | |
| Amazon API Gateway (Ohio) | Service is operating normally | |
| Amazon API Gateway (Oregon) | Service is operating normally | |
| Amazon AppStream 2.0 (N. Virginia) | Service is operating normally | |
| Amazon AppStream 2.0 (Oregon) | Service is operating normally | |

[ GitPitch @ github/nre-learning/gitpitch-presos ]


NETWORK HEALTH DASHBOARD
Amazon Web Services
Current Status - Jun 17, 2018 PDT
North America
South America
Europe
Asia Pacific
Contact Us
Recent Events
Details
RSS
No recent events.
Remaining Services
Details
RSS
switch001
Network device is operating normally
switch002
Network device is operating normally
switch003
Network device is operating normally
switch004
Network device is operating normally
router001
Network device is operating normally
router002
Network device is operating normally
router003
Network device is operating normally
router 004
Network device is operating normally

# TRADEOFFS

- Don't try to go for 100% uptime (error budgets)
- Don't try to automate everything
- Buy/assemble where you can, build when you must

# BLAMELESS POST-MORTEMS

*Failure is okay. Repeated failure is not.*

# AUTOMATE THE COFFEE!

# FOCUS DOWN

- Use "Unix" philosophy for components
- Composition over Wonder Product
- Data flows like a stream

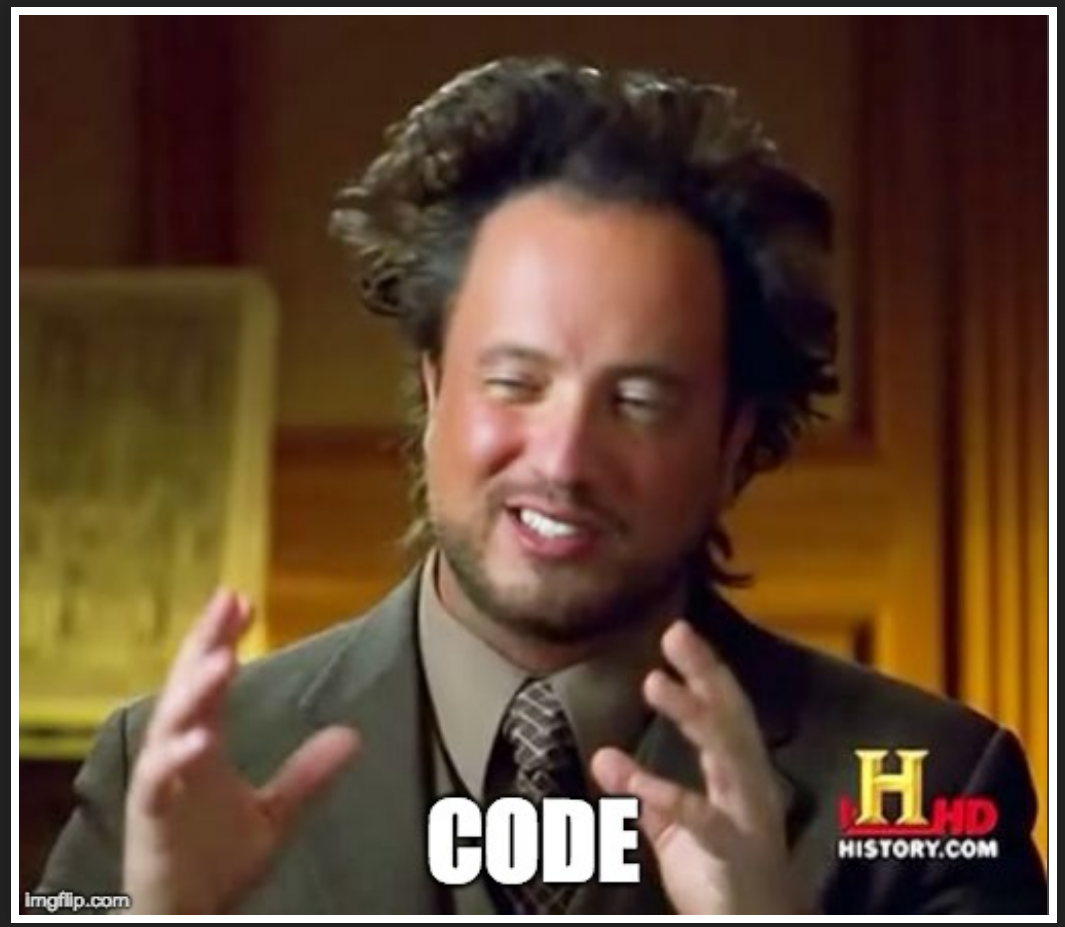
# NRE PRINCIPLES

- **Composition** - 80/20 rule
- **Outcomes** - service health is what matters
- **Tradeoffs** - Make decisions for the greater good
- **Blameless Post-Mortems** - Always be moving forward

# NRE RECIPES

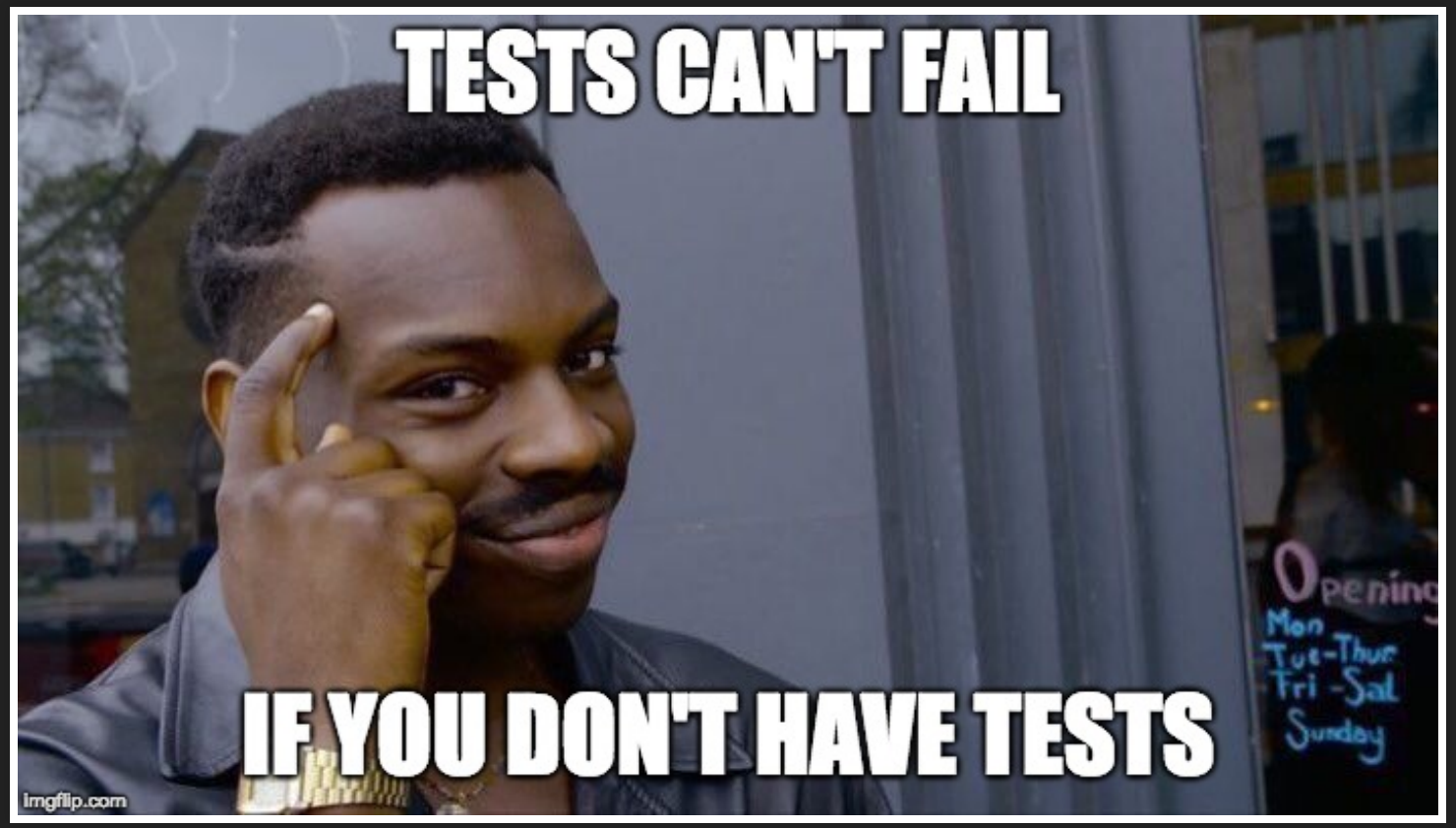
- Infrastructure as Code
- Automated Testing
- Event-Driven Automation

# INFRASTRUCTURE AS CODE



*(Treat your) Infrastructure as (if it was) Code*

# AUTOMATED TESTING



**Martin Thompson**
@mjpt777

Follow

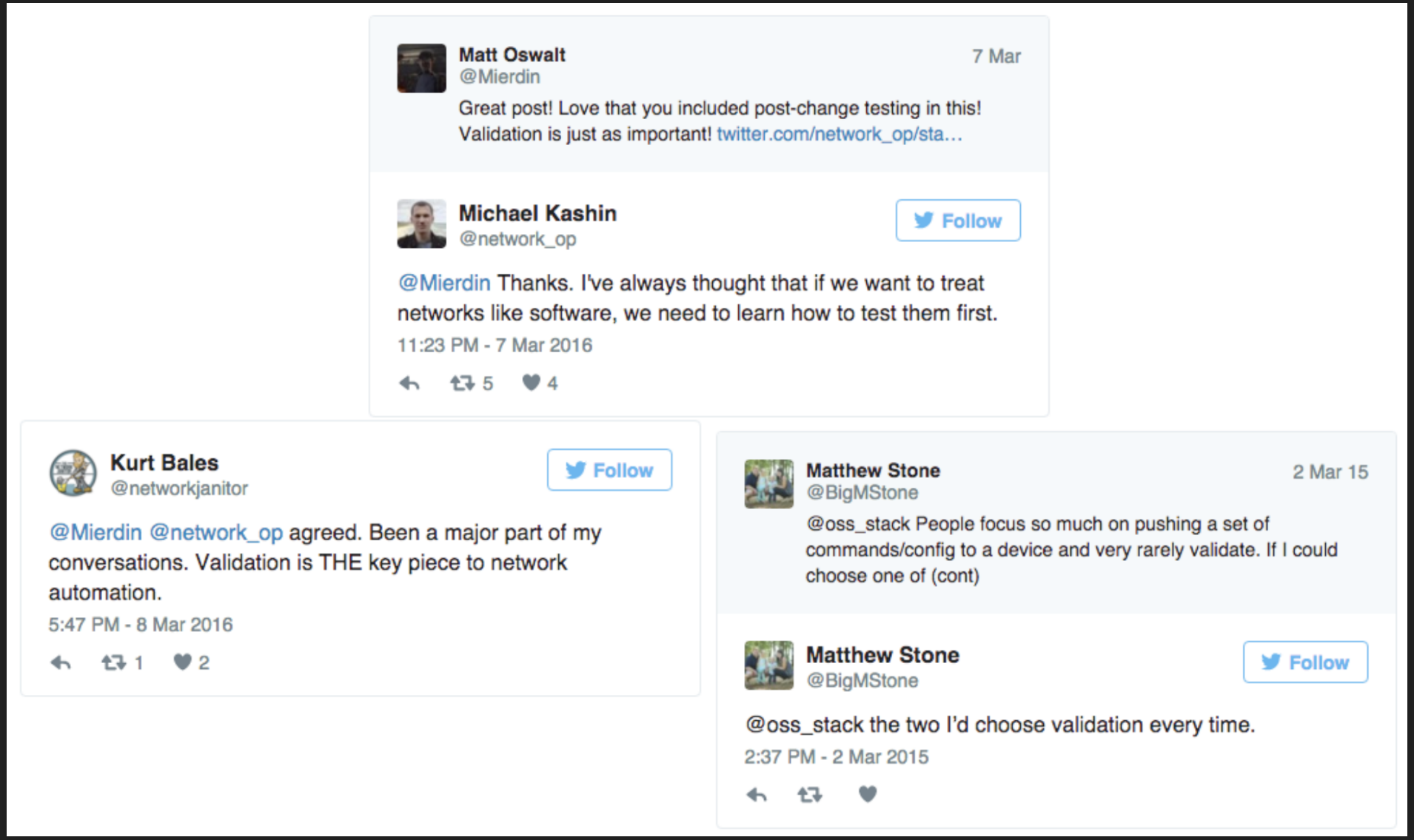
Any part of a system should not be considered working until tested. Tests are software based experiments and key to evidence based learning.

9:42 AM - 5 Jun 2018

**28** Retweets **57** Likes

2 28 57

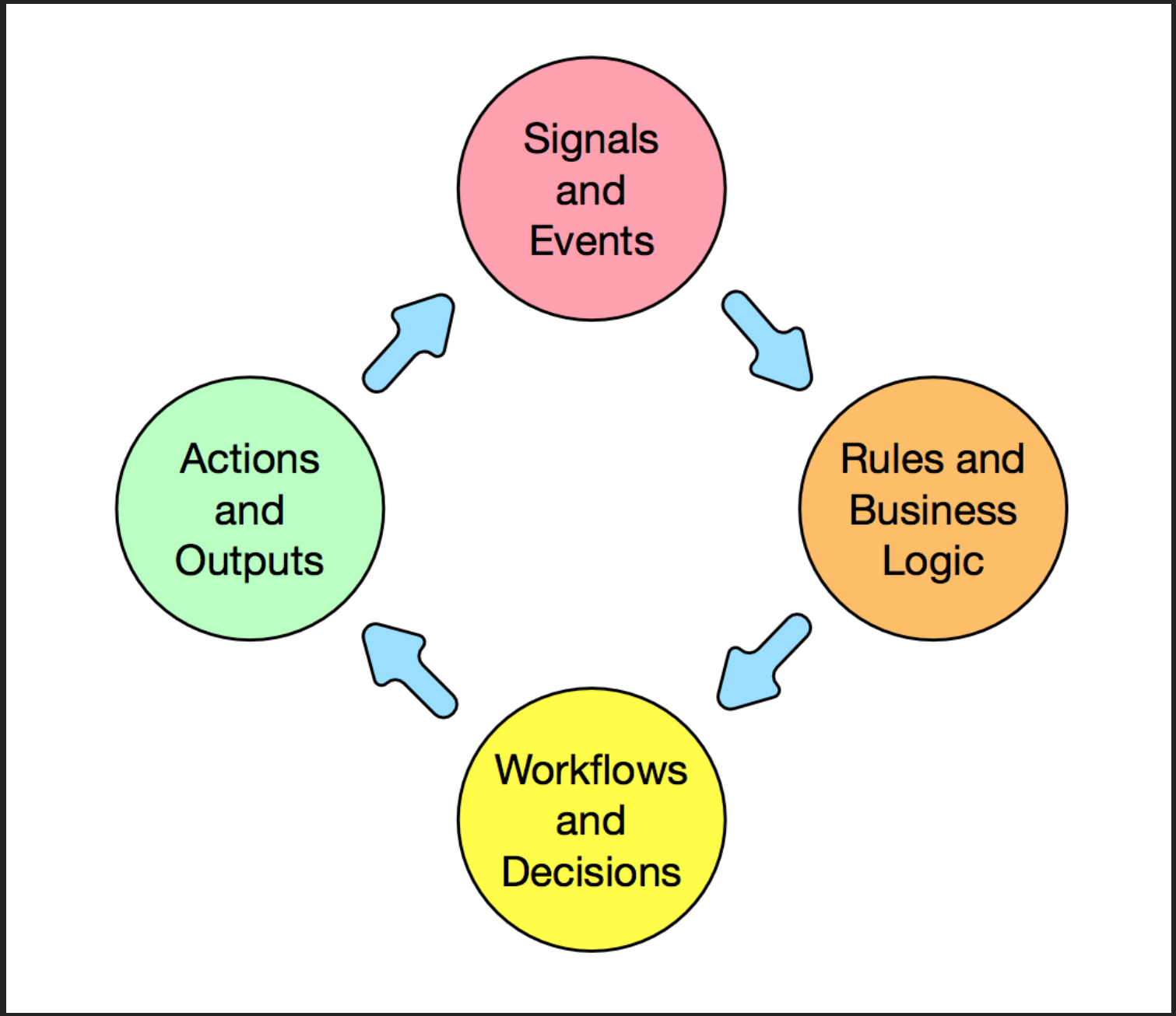
Tweet your reply


Matt Oswalt
@Mierdin
7 Mar
Great post! Love that you included post-change testing in this! Validation is just as important! twitter.com/network_op/sta…
Michael Kashin
@network_op
Follow
@Mierdin Thanks. I've always thought that if we want to treat networks like software, we need to learn how to test them first.
11:23 PM - 7 Mar 2016
5
4
Kurt Bales
@networkjanitor
Follow
@Mierdin @network_op agreed. Been a major part of my conversations. Validation is THE key piece to network automation.
5:47 PM - 8 Mar 2016
1
2
Matthew Stone
@BigMStone
2 Mar 15
@oss_stack People focus so much on pushing a set of commands/config to a device and very rarely validate. If I could choose one of (cont)
Matthew Stone
@BigMStone
Follow
@oss_stack the two I'd choose validation every time.
2:37 PM - 2 Mar 2015

# AUTOMATED TESTING

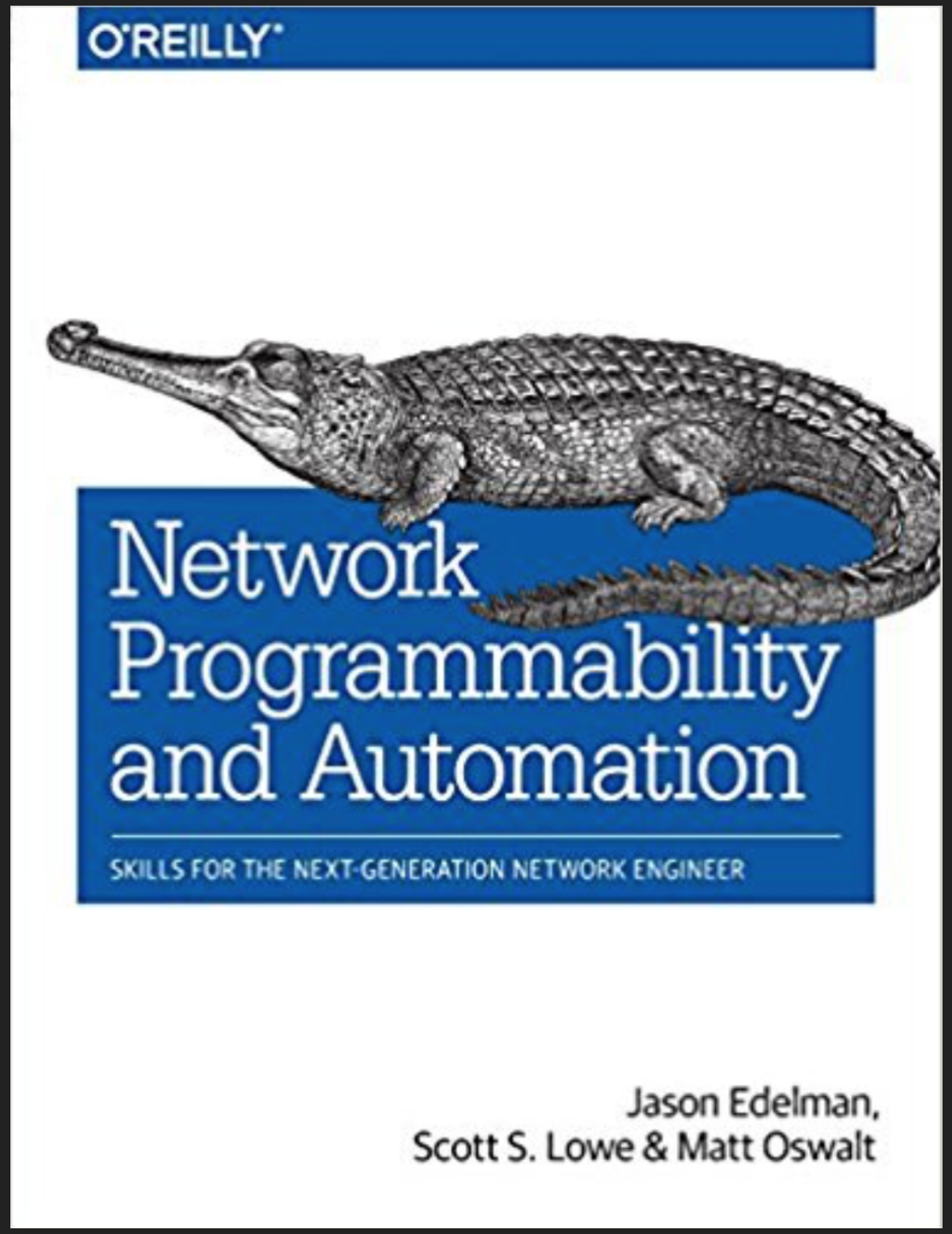
- Compliance Validation
- Safety net for changes
- "What if" analysis

# EVENT-DRIVEN INFRASTRUCTURE


Signals and Events
Rules and Business Logic
Workflows and Decisions
Actions and Outputs

# EVENT-DRIVEN INFRASTRUCTURE

- Triage - Incident Prep
- Auto-remediation
- ChatOps


O'REILLY
Network Programmability and Automation
SKILLS FOR THE NEXT-GENERATION NETWORK ENGINEER
Jason Edelman,
Scott S. Lowe & Matt Oswalt