Stealing the Best Ideas from DevOps
Applying DevOps outside of SDLC

Thomas Limoncelli
@YesThatTom
Who is Tom Limoncelli?

- SRE Manager at Stack Overflow, Inc (NYC)
- Sysadmin since 1988 (Google, AT&T/Bell Labs, Mentor)
- Blog: EverythingSysadmin.com  Twitter: @YesThatTom
- queue.acm.org Bi-Monthly Column
- Author…
The Principles of Punk Rock
The Principles of Punk Rock + Music = The Clash
1# DO IT YOURSELF
2# ANYONE CAN DO IT
3# EVERYONE CAN BE AN ARTIST
The Principles of Punk Rock + Music = The Clash

A + B = C

Leather Jackets
Swearing
Heavy drinking
Sniffing glue
The Principles of Punk Rock + Music = The Clash

The Principles of Punk Rock + Music = RAMONES

Leather Jackets
Swearing
Heavy drinking
Sniffing glue
The Principles of Punk Rock + Music = The Clash

The Principles of Punk Rock + Music = Ramones

The Principles of Punk Rock + Poetry = [Leather Jackets, Swearing, Heavy drinking, Sniffing glue]
The Principles of Punk Rock + Music = The Clash

The Principles of Punk Rock + Music = Ramones

The Principles of Punk Rock + Poetry = Patti Smith

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The Principles of Punk Rock + Literature =
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The Principles of Punk Rock + Literature = Zines

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The Principles of DevOps
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The Principles of DevOps + Software Engineering = E

The Principles of DevOps + Software Engineering = Netflix

The Principles of DevOps + Software Engineering = Walmart
The DevOps Principles

(1) The Three Ways of DevOps
(2) The Small Batches Principle
(3) Minimum Viable Product
The Principles of DevOps + Software Engineering = Git CI/CD / Jenkins Puppet/Chef/CfEng Docker/Containers

The Principles of DevOps + Software Engineering = NETFLIX Walmart
The Principles of DevOps + Software Engineering = 

Git, CI/CD / Jenkins, Puppet/Chef/CfEng, Docker/Containers

The Principles of DevOps + Software Engineering = 

Netflix, Walmart
The Principles of DevOps + Software Engineering = 

The Principles of DevOps + Software Engineering = 

The Principles of DevOps + Software Engineering = 

Git
CI/CD / Jenkins
Puppet/Chef/CfEng
Docker/Containers
The Principles of DevOps + Software Engineering = E

The Principles of DevOps + Software Engineering = Netflix

The Principles of DevOps + New Employee Onboarding = Walmart

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The Principles of DevOps + New Employee Onboarding = Walmart
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The Principles of DevOps = Productivity
The Principles of DevOps + Software Engineering = E

The Principles of DevOps + Software Engineering =

The Principles of DevOps + New Employee Onboarding =

The Principles of DevOps + Failovers =

Git
CI/CD / Jenkins
Puppet/Chef/CfEng
Docker/Containers

Netflix
Walmart

Productivity
The Principles of DevOps + Software Engineering = E

The Principles of DevOps + Software Engineering = Netflix

The Principles of DevOps + New Employee Onboarding = Walmart

The Principles of DevOps + Failovers = Productivity

Git
CI/CD / Jenkins
Puppet/Chef/CfEng
Docker/Containers
The Principles of DevOps

Software Engineering

=

The Principles of DevOps

Software Engineering

=

New Employee Onboarding

Failovers

=
The DevOps Principles

(1) The Three Ways of DevOps
(2) The Small Batches Principle
(3) Minimum Viable Product
(1) The Three Ways of DevOps
The Three Ways of DevOps

(you really should read this book)
The Three Ways of DevOps
(a way to improve complex processes)
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The Three Ways of DevOps

System Thinking

Amplify Feedback Loops

Culture of Continual Experimentation and Learning
The Three Ways of DevOps

The Process

Amplify Feedback Loops

Culture of Continual Experimentation and Learning
The Three Ways of DevOps

- The Process
- Communication
- Culture of Continual Experimentation and Learning
The Three Ways of DevOps

The Process

Communication

Trying New Things
The Three Ways of DevOps

- The Process
- Communication
- Trying New Things
The Three Ways of DevOps

1. The Process
2. Communication
3. Trying New Things
The Three Ways of DevOps

The Process
- Suck
- Awesome

Communication
- Lacking
- Comprehensive

Trying New Things
The Three Ways of DevOps

The Process
- Suck
- Awesome

Communication
- Lacking
- Comprehensive

Trying New Things
- Resisted
- Constant
The Three Ways of DevOps

**The Process**
- Nonexistent (Awesome)
- Suck

**Communication**
- Punished (Comprehensive)
- Lacking

**Trying New Things**
- Paralysis (Constant)
- Resisted
The Three Ways of DevOps
(a way to improve employee onboarding)
New Employee Onboarding

• **Process:** Ad hoc. Improvised. Broken.
• **Communication:** Terrible. IT given no warning about arrivals.
• **Trying New Things:** Out of the question.

• **Result:**
  • New employees unproductive for 4 weeks.
  • First impression: I just joined a company of idiots.
  • Everyone blames the IT department.
New Employee Onboarding

- **Process:**
  - Got agreement on a “onboarding timeline”.
  - Automated OS install/config for workstations.

- **Communication:**
  - ID’ed process owner. Communication channels.

- **Trying New Things:**
  - Efficiency through alignment: Monday is Start Day.
    - Google Sheets -> Trello -> Custom app.

- **Improvements:**
  - New employees: Productive on day #1.
  - First impression: Excellence/cooperation/efficiency.
  - Less work for everyone involved!
  - Opened the door to software to manage accounts, machines, etc.
And more...

Customer support escalations:
- Cust
- Support
- 2nd Tier
- PM/Dev

Product fulfillment:
- Sales
- CFO
- Make
- Shipping
(1) The Three Ways of DevOps
(2) The Small Batches Principle
The Small Batches Principle:

Doing work in small batches
is better than big batches.

[Work. Check. Work. Check. Work. Check.] is better than

[Work, work, work, work, Check.]
StackOverflow.com

NY

CO

The Internet
StackOverflow.com

NY → The Internet → CO
Big Batch Failovers

• The NY Datacenter fails less than once a year.

• In that time:
  • “unintentional differences” accumulate.
  • New SRE team members are hired
The 2013 failover was a “big batch”

- Took 10+ hours (15 minutes user-visible down-time)
- Required “hands on” by 3 teams.
- Found 30+ “improvements needed”
- Certain people were S.P.O.F.
Needed: “small batch” failovers

- More frequent failovers == smaller accumulation of differences.
- So…. we Force Failovers Frequently to achieve our “small batches”
Drill Results

- Bugs Filed
  - 30
  - 20
  - 12
  - 5
  - 10
  - 5
  - 2
  - 1

- Labor Hours
  - 10
  - 5
  - 2
  - 1
Why?

• Each drill “surfaces” areas of improvement.
• Each member of the team gains experience and builds confidence.
• Highlighted automation, documentation, and resource needs.
• Frequency reduces risk!
### Other applications of SBP

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<td>“I’ll lose 40 pounds”</td>
<td>“I’ll lose 1 pound, again and again”</td>
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(2) The Small Batches Principle
(3) Minimum Viable Product
Minimum Viable Product

Delivering some value sooner is better than all value later.
Delivering some value sooner is better than all value later.

Minimum Viable Product

features, stuff, the goods, benefits
10 months
10 months
10 months

Boo!
Not what we wanted!
Yuck!
10 months

Start

Launch

!!

Not what we wanted!

Yuck!
Boo! Not what we wanted! Yuck!
Benefits

• You help people sooner! (“Accelerated Delivery of Value”)
  • One feature now is better than all features later!

• Earlier Feedback!
  • Validates assumptions.

• A chance to pivot!
  • Users don’t like it? Change direction!

• Operations/IT get a chance to develop operational expertise:
  • Run-book, Upgrade process, Failover practice, Documentation, etc.
1. Less waste! People are being helped!
2. Happy users advocate for you.
3. The last 20% is "would be nice."

PROJECT CANCELLED!
OS Install Automation

1. Replace “carrying DVD to desktop” with netboot.
   • Only a specific VLAN.
   • No OS customization.
   • No RAID/special NICs.
OS Install Automation

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2. Eliminate all prompts.
3. Customize OS.
4. Start Puppet.
OS Install Automation

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   - No RAID/special NICs.
2. Eliminate all prompts.
3. Customize OS.
4. Start Puppet.

- Activate for more VLANs.
- Handle RAID controllers.
- Dual NICs.
- Replicate in other buildings.
- Add host to inventory.
- Choice of disk layouts.
- Other operating systems.
- Boot LiveCD.
The Monitoring Project

6 months in:
The Monitoring Project

6 months in:

- A lot of debates.
The Monitoring Project

6 months in:

• A lot of debates.
• A lot of disagreements.
The Monitoring Project

6 months in:

- A lot of debates.
- A lot of disagreements.
- A lot of specification documents.
The Monitoring Project

6 months in:

- A lot of debates.
- A lot of disagreements.
- A lot of specification documents.
- Nothing is being monitored.
The Monitoring Project II

1. Install open source system.
2. Monitor 1 server.
   - Ooops! SNMP disabled
4. No dashboards?
5. Change software.
6. Focus on self-service dashboards.
7. Monitor more devices.
8. …
9. …
10. …
11. …
12. …
13. …
14. …
15. …
The Book Project
The Practice of System and Network Administration

“Volume 1”
Enterprise/IT/Helpdesk

“Volume 2”
SRE/Cloud/Web
2001
The Clash

2006
The Practice of System and Network Administration
2nd Edition

2014
The Practice of System and Network Administration
3rd Edition

2016
“Volume 1”
Enterprise/IT/Helpdesk

“Volume 2”
SRE/Cloud/Web

The Ramones
2001: The Clash

2006: "Volume 1" Enterprise/IT/Helpdesk

2014: "Volume 2" SRE/Cloud/Web

2016: "Volume 3"
<table>
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<tr>
<th>Year</th>
<th>Edition</th>
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<th>Authors</th>
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<td>2006</td>
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<td>The Practice of System and Network Administration</td>
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<td>3rd Edition</td>
<td>“Volume 2” SRE/Cloud/Web</td>
<td>Thomas A. Limoncelli, Steven R. Chalup, Christina J. Hagan</td>
<td>GIT, LaTeX</td>
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2 Months from Deadline

80% done
Rush to finish!
3rd Edition Goals

1. Fix Chapter Order
2. New chapters (22)
3. Replaced outdated chapters (6)
4. Update all other chapters
Project Phases

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(3) Minimum Viable Product
The Three Ways of DevOps: *Improves Complex Process*
- Software Engineering
- Support Escalations
- Restaurant Logistics
- Product Fulfillment
- New Employee Onboarding

Small Batches Principle: *Reduce Risk/Better Quality*
- Failovers
- Desktop PC Upgrades
- Migrating Users
- Relationships
- Losing Weight

Minimum Viable Product: *Deliver Value Faster*
- Software Releases
- OS Installation
- Controversial Projects
- Unclear Requirements
- Writing Books
### The Three Ways of DevOps: Improves Complex Process
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the-sysadmin-book.com
(enterprise/IT/helpdesk)
Vol 1
Vol 2

the-cloud-book.com
(web/Cloud/SRE)
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