



Making the Business Case

For DevOps and CI/CD



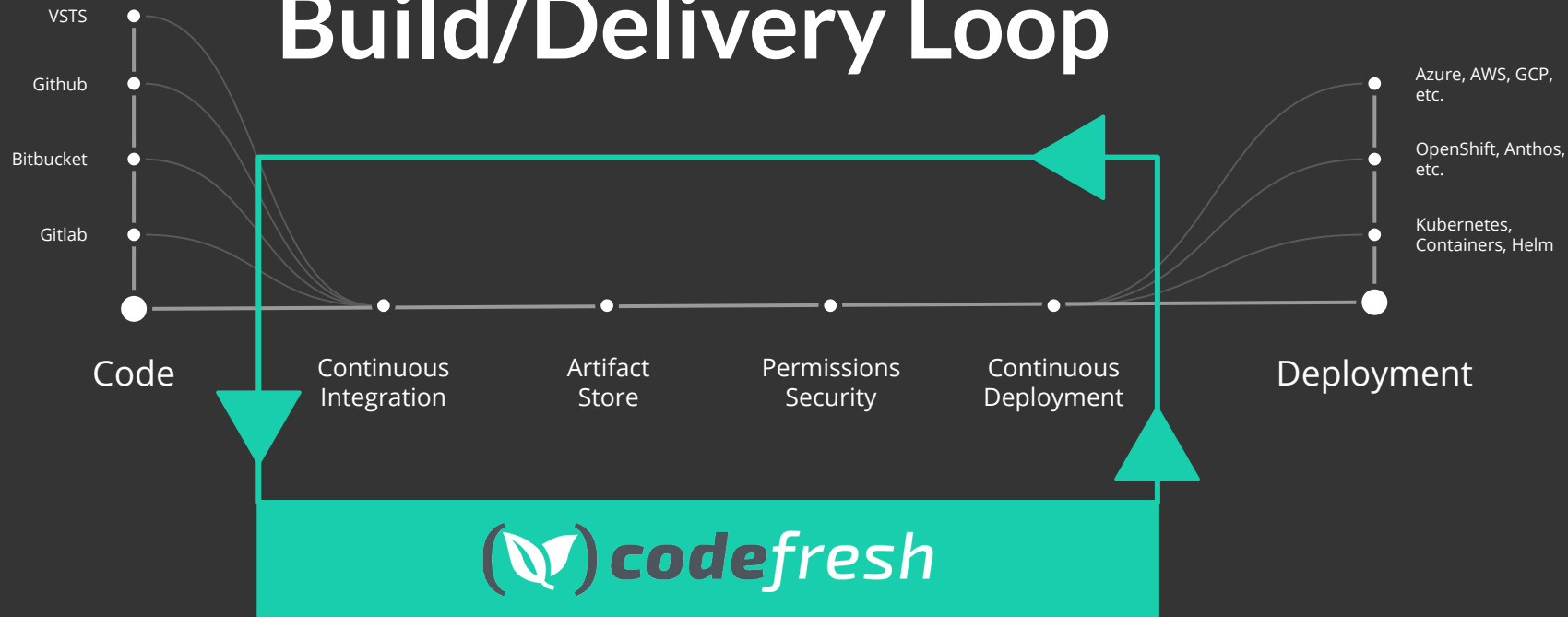
DAN GARFIELD

Dan Garfield

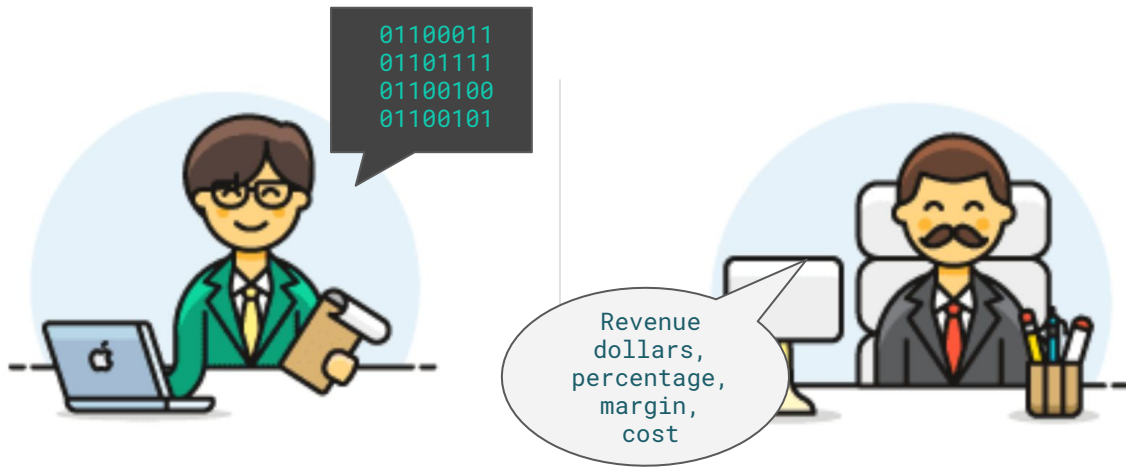
Chief Technology Evangelist



The Code Build/Delivery Loop



Engineering and Business don't always speak the same language



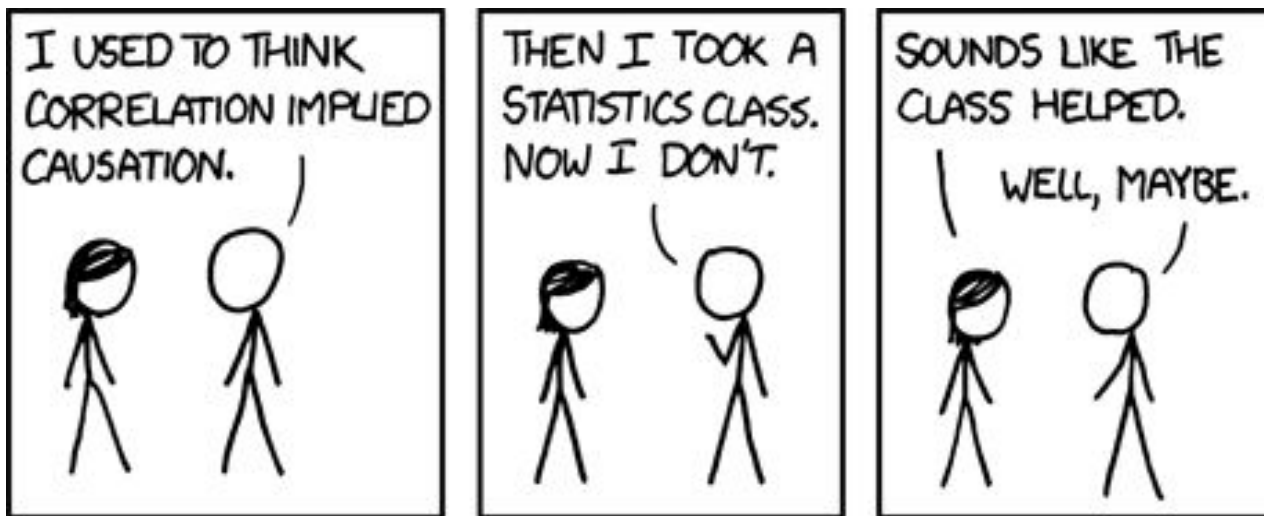
“

I couldn't prove that anything I did had a positive impact on Google.... My bug discoveries caused the overall bug count to increase.

Michael Lynch

Feb 2018 -<https://mtlynch.io/why-i-quit-google/>

Disclaimer: Sometimes numbers lie



Pull Requests
WELCOME

Let's talk DevOps

- 4 ways DevOps provides value
- Calculating \$\$
- Tools to help you
- Build vs Buy

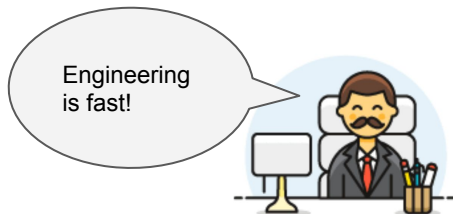
Productivity Engineering

Site Reliability Engineering

Productivity Engineering

metrics

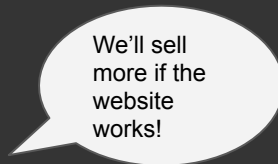
Change Lead Time
Deploy Frequency



Site Reliability Engineering

metrics

Change Failure Rate
Mean Time to Recover
Uptime



1) *Avoiding Downtime*

Experts estimate Costco's website crash on Thanksgiving could reach \$11M in losses

Costco said it would extend its Thursday-only deals into Friday.



By **Catherine Thorbecke**

November 29, 2019, 11:04 AM • 4 min read



TRANSPORTATION
Southwest Airlines computer outage costs could reach \$82M

The Cost of Downtime At The World's Biggest Online Retailer

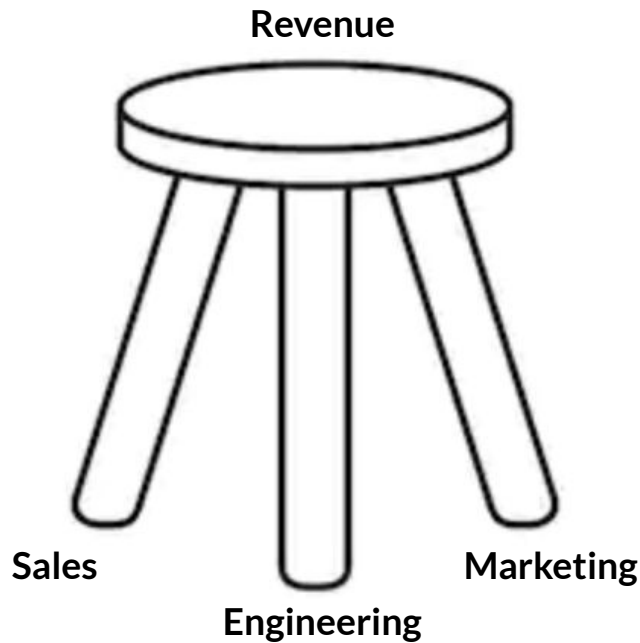
Last updated by [UpGuard](#) on November 20, 2019

Amazon reported revenues of \$107 billion in 2018, which comes out to \$203,577 every minute in today's numbers, or a **\$2,646,501 price tag for the 13 minute episode of downtime.**

How much value does uptime provide?

Annual Revenue/Minutes in a year =
\$/minute

$\$107 \text{ billion} / 365 / 24 / 60 = \$203,577 / \text{minute}$



If the site is down, we can't make money!



Getting to
“five nines” is
like running the
24 hour
LeMans, 365

- 99.8% 17.52 hours per year
- 99.9% 8.76 hours per year
- 99.99% 52.56 minutes per year
- 99.999% 5.26 minutes per year



All of these things have to work together

Continuous Integration

- Version control
- Code review
- Unit testing
- Security testing
- Test coverage

Integration Testing

- Preview environments
- QA
- Packaging
- Artifacts
- Repositories

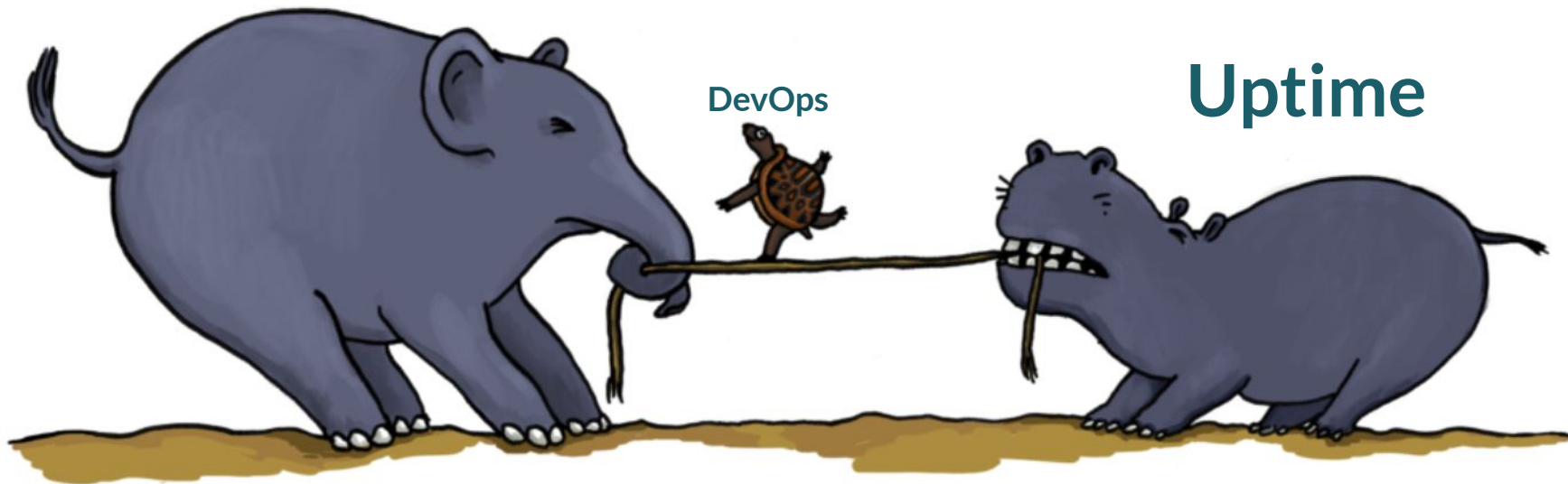
Continuous Delivery

- Rollouts
- Verification
- Rollbacks

Infrastructure

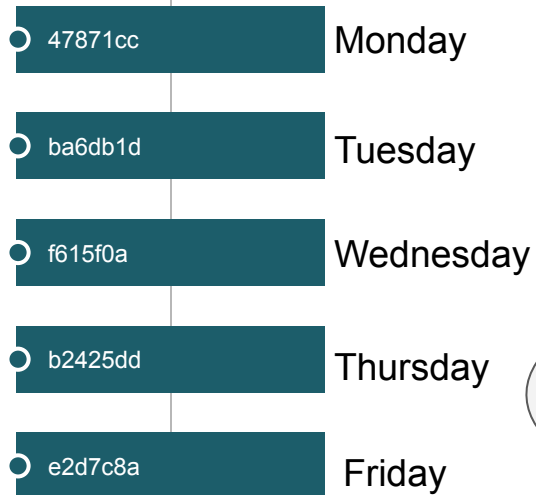
- Architecture
- Fail-over
- Scalability
- Monitoring
- Alerts
- Logging

Code Delivery



Daily Releases

Small, low-risk changes



Deploying more often reduces risk!



Quarterly Releases

Huge, high-risk changes

January
April
July
October
January

...
47871cc
...
ba6db1d
...
f615f0a
...
B2425dd
...
E2d7c8a
...

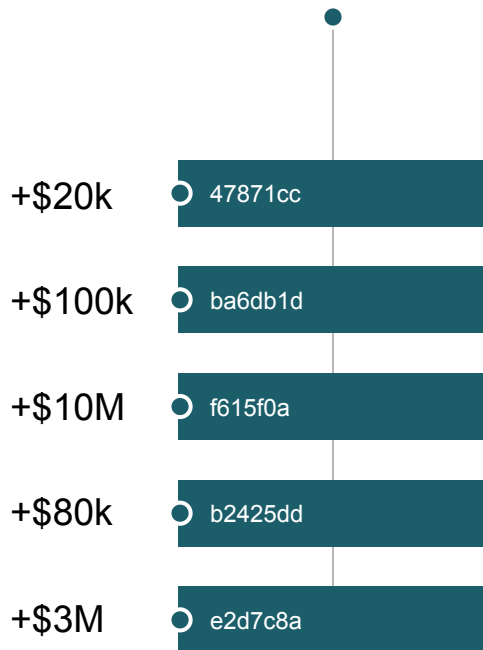
2) Delivering Faster

“

Unwritten code has the
same value as
undelivered code.



Every software change delivers value



Code delivery cycle
went from 3 days to 3
hours.

Steelcase



Every software change delivers value

Code delivery cycle
went from 3 days to 3
hours.



Steelcase 2019 Revenue
was \$3.4 Billion

If \$100M was from new
changes, and we reduced
delivery 3 days, we made
an extra \$822K

Value of delivering software *just 3 days faster*

\$100M In new business value



X

3 Days Saved



/

365 Days/yr



New Revenue
\$822K

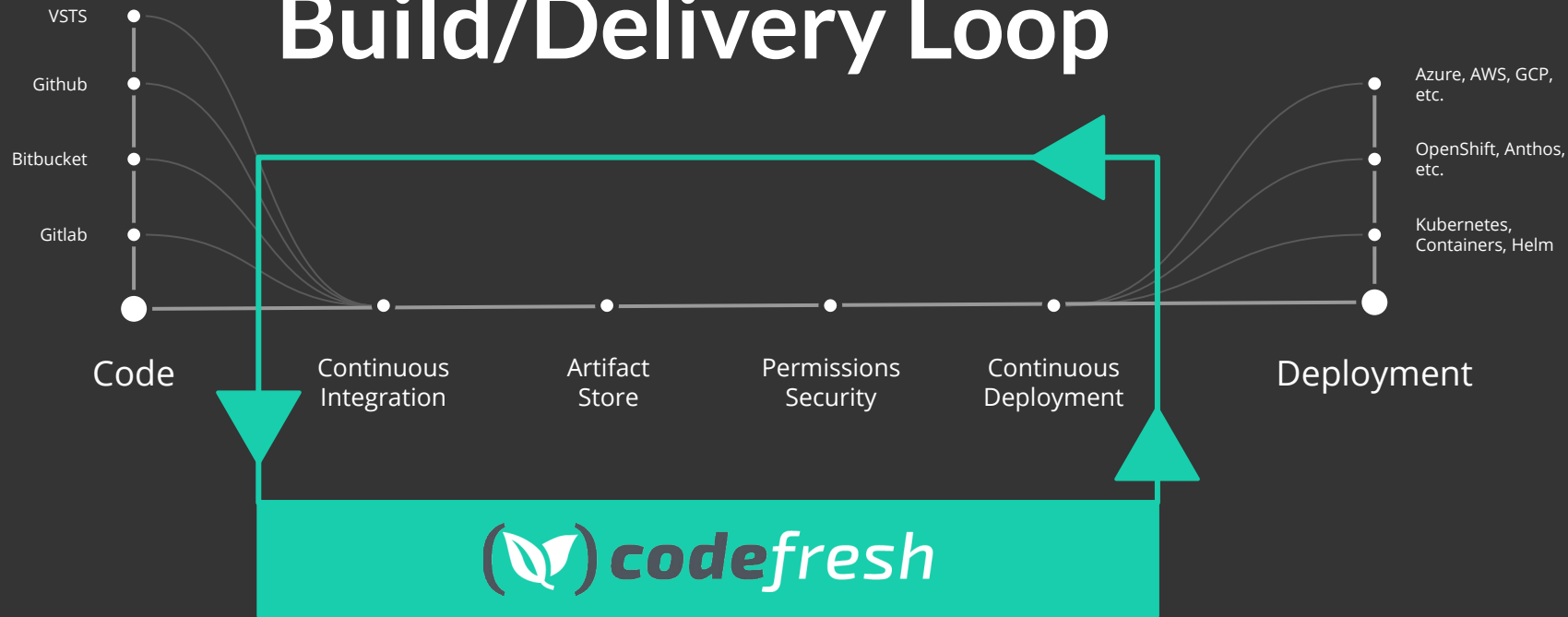
Lead time to change

How much business value you pushed last year * (time saved/time period)

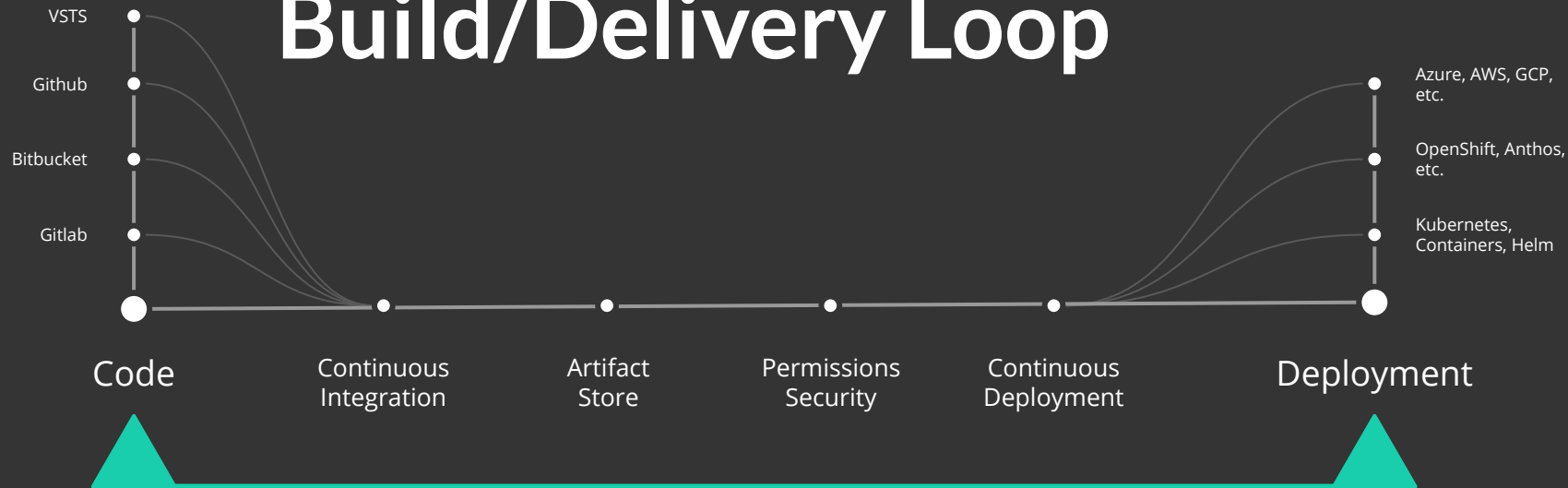
$$\$100\text{M} * 3 \text{ days} / 365 \text{ days per year} = \$822\text{k}$$

Not sure how much value you delivered? Take total cost of engineering salaries * 8 for a rough estimate.

The Code Build/Delivery Loop



The Code Build/Delivery Loop



Lead time to change

Average days from first commit to deploy

3) Saving Engineering Time

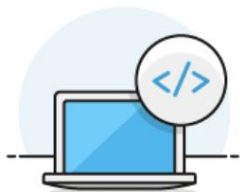
Value of cutting build times by *just* 5 mins

100 Engineers



X

5 Builds/Day



X

Saving 5
Min/Build



Making Average
\$1.25/minute

Annual Savings
\$781k

“

When we switched to
Codefresh our build time went
from 2.5 hours to 12 minutes.



Ethan Fremen, Hover
Kubecon San Diego 2019

Saving Engineering Time

Cost of engineering per minute * builds/day * 251 working days/year * minutes saved * number of engineers

\$1.25 eng per minute * 5 builds/day * 251 working days/year * 5 minutes saved * 100 engineers = \$784k/year

Optional: Every employee has an overhead cost, often 10-30% more than their salary. This may be included in total cost estimates.

4) Reducing Infrastructure Overhead

Going Cloud-Native!

30% of infra
budgets are
spent on idle
machines



Spot Instances

Can reduce cloud costs 90%, requires great architecture and failover

Auto-scaling

Add nodes as needed, toss when done

Tighter Packing

Packing smaller microservices is more efficient than horizontally scaled monoliths

<https://spotinst.com/blog/cio-talk-cost-savings-for-agile-enterprise/>
<https://deloitte.wsj.com/cio/2018/08/27/3-reasons-to-go-cloud-native/>

Build v Buy

Codefresh Customer Case Study

Never underestimate
the cost of
maintenance!

- Using a hand-rolled deployment tool
- With 2 full time engineers to maintain it
- More investment needed to support Kubernetes
- Vs \$47k Codefresh license

Hand-rolled tools

\$68,994

COST TO BUILD

\$216,838

ANNUAL MAINTENANCE

Codefresh License

\$47K

1st Year Savings

\$239k



Summary

- Don't be afraid to put costs to paper!
- DevOps is one of the most valuable investments a business can make
- Speak the language of business, ie dollars and cents
- Use the equations we've shared!
- Give us feedback!



Upcoming Events

Codefresh.io/events



Related Resources

CI/CD Pipelines for Microservices

codefresh.io/events/ci-cd-pipelines-microservices/

Multi-cloud Canary with Failover

codefresh.io/events/multi-cloud-ci-cd-failover-powered-kubernetes-istio-helm-codefresh/

Using Multi-stage Docker, Go, Java & Bazel to DESTROY long build times

codefresh.io/events/devops-com-using-multi-stage-docker-go-java-bazel-destroy-long-build-times/



Questions?

Try Codefresh free at
codefresh.io

