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Extending the error budget model

SRECon2019 / NYC

Version 1903.3

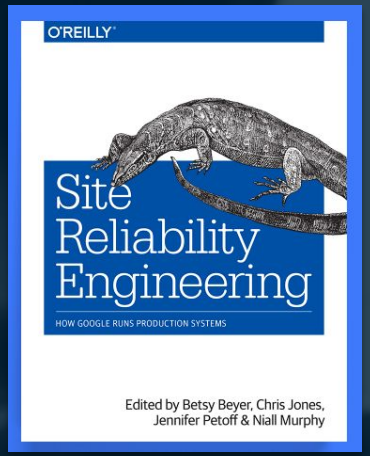


Jim Thomson



David Laing

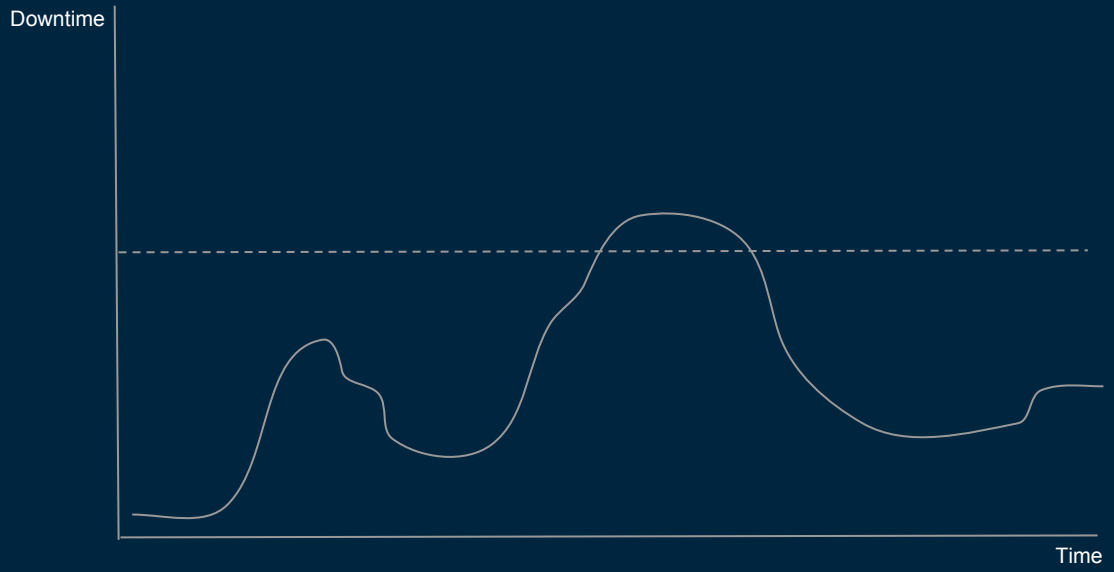
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Error budgets bring sanity to availability

Error budget mechanics

A life changing approach to achieving operating balance



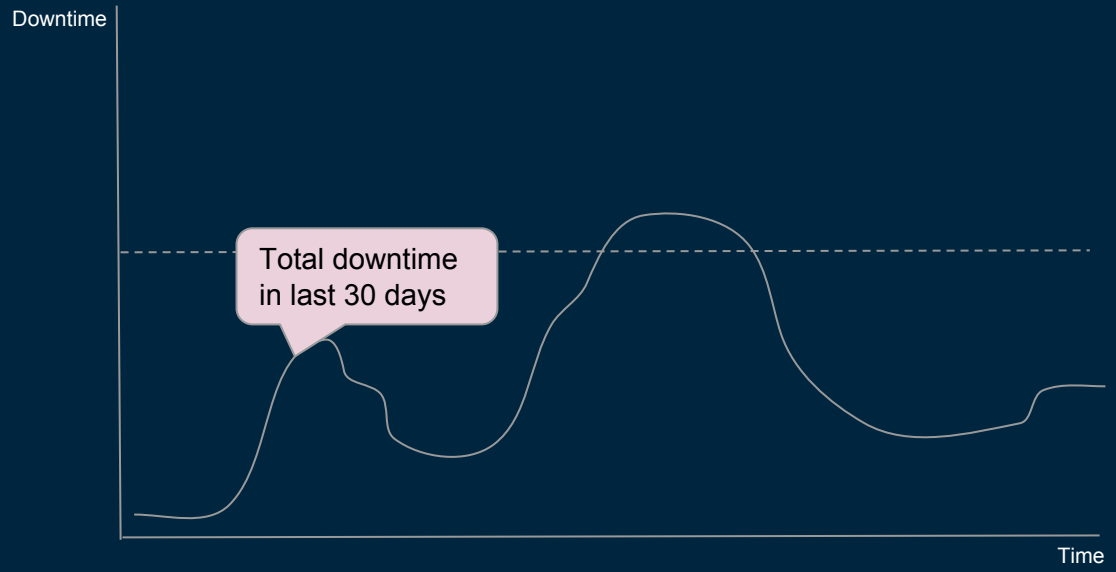
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Error budget mechanics

A life changing approach to achieving operating balance

SLI - Service Level Indicator

- a measurement of user value delivered



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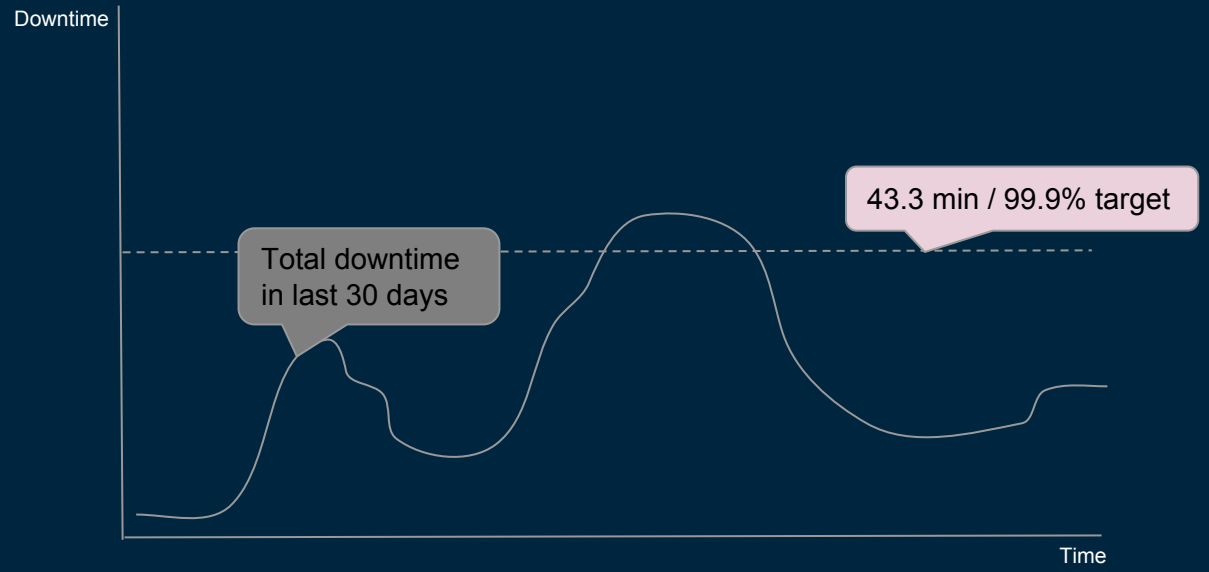
Error budget mechanics

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SLO - Service Level Objective

a threshold that makes sense in your context

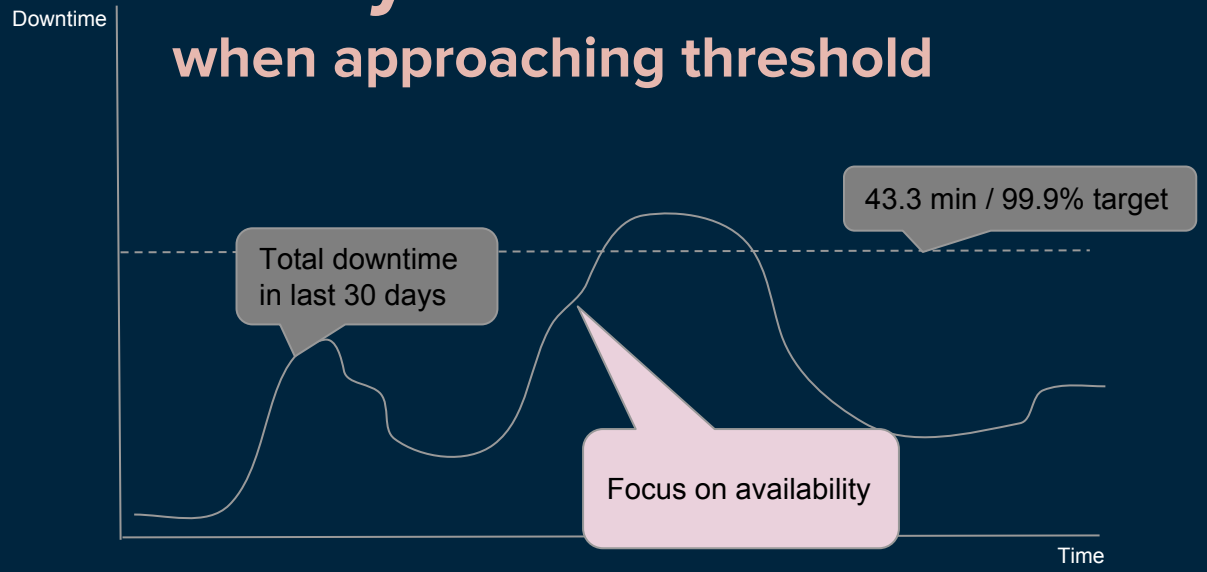


Error budget mechanics

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  a threshold that makes sense in your context

Policy - take action
when approaching threshold

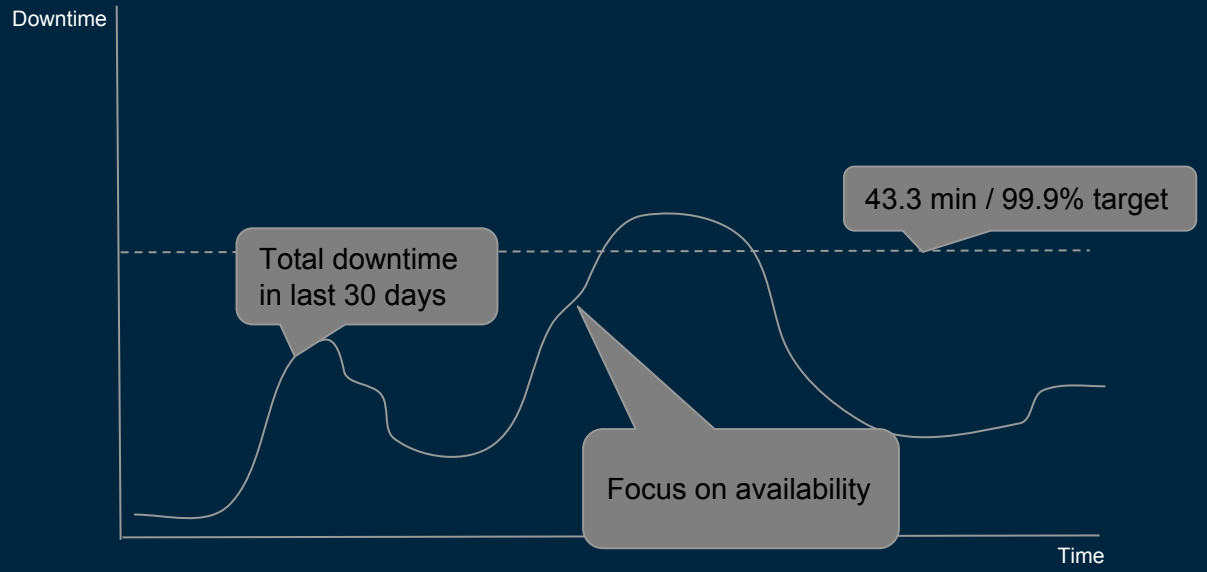


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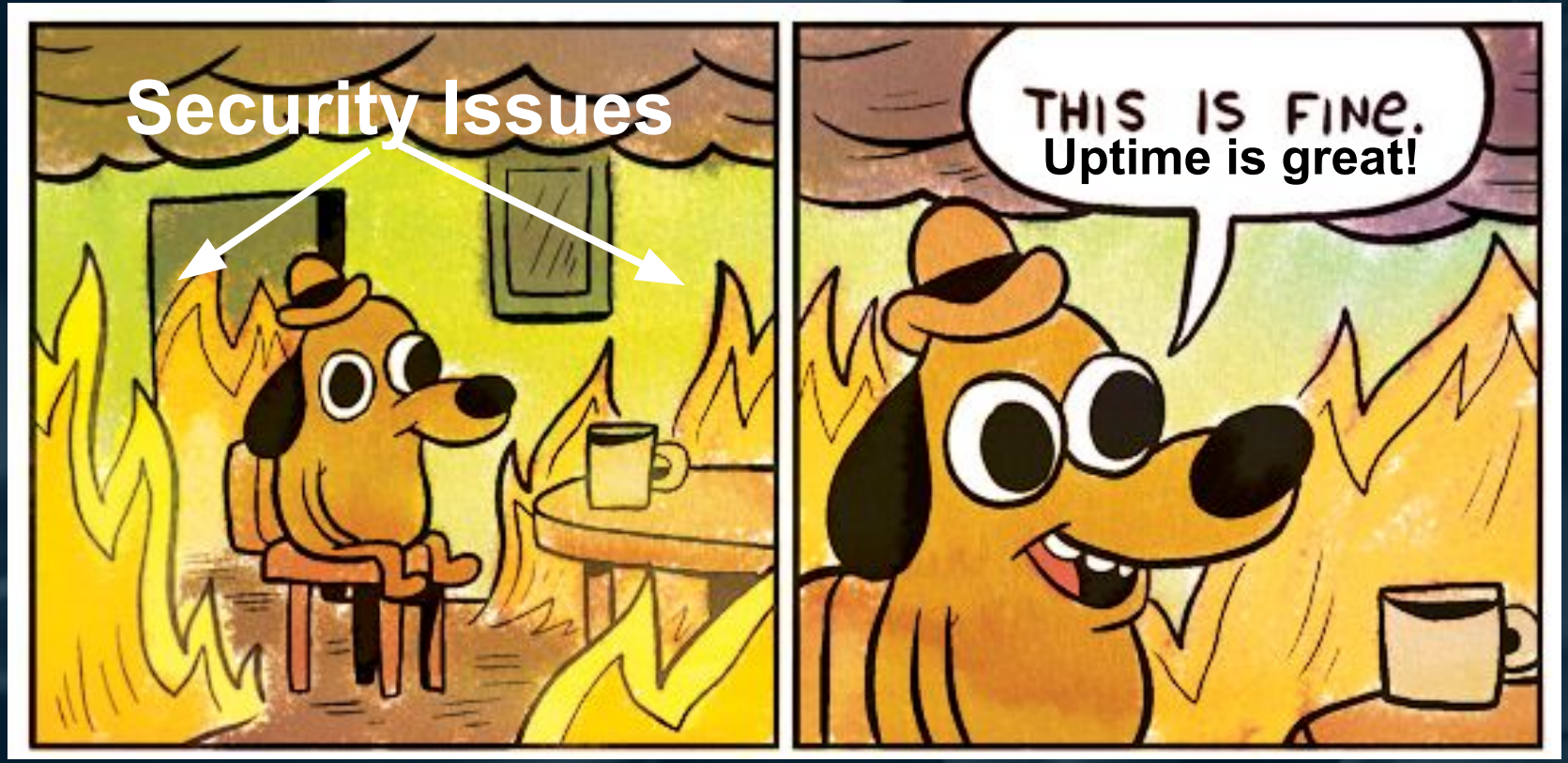


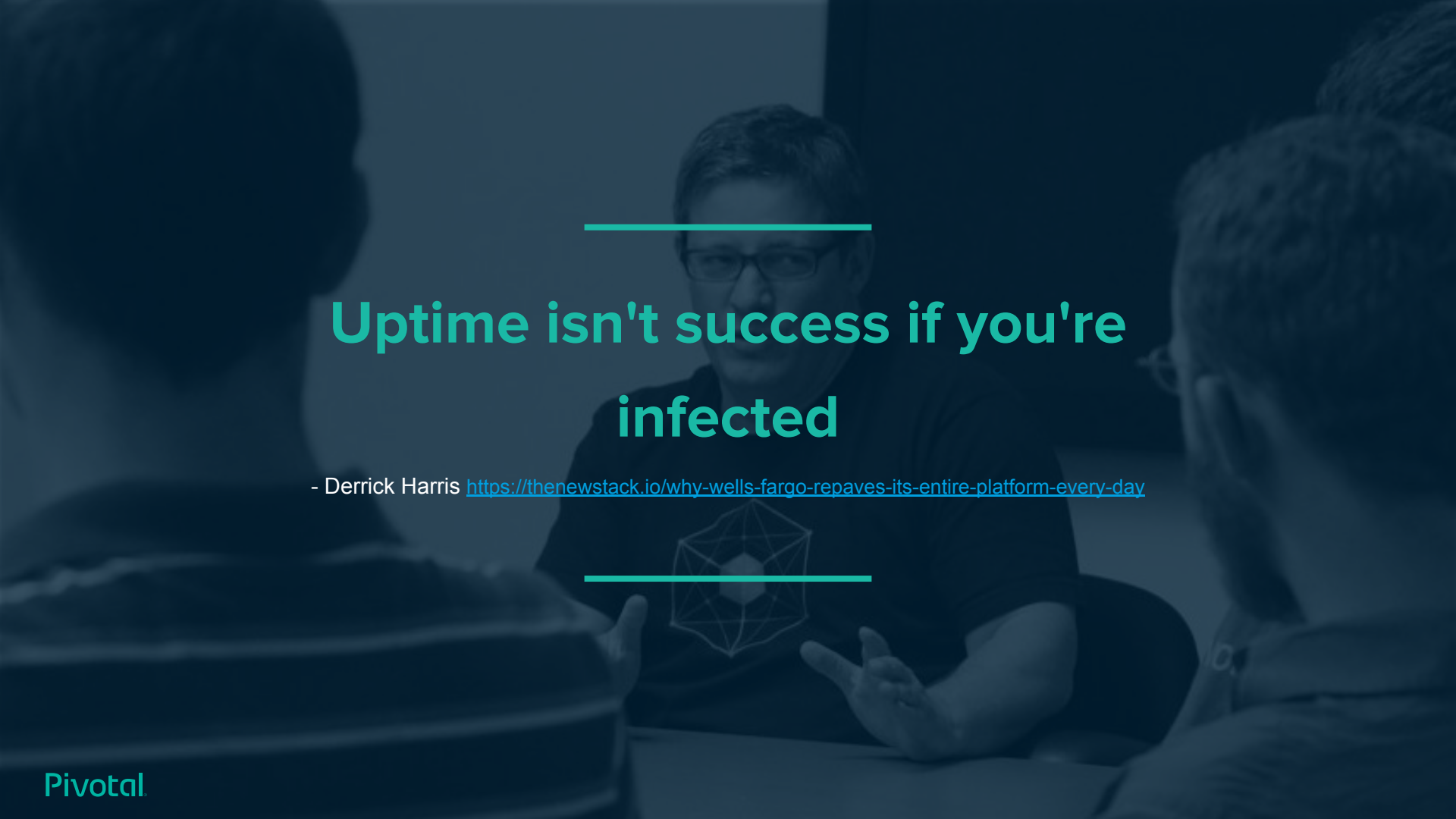
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The End



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Security Issues
THIS IS FINE.
Uptime is great!



Uptime isn't success if you're infected

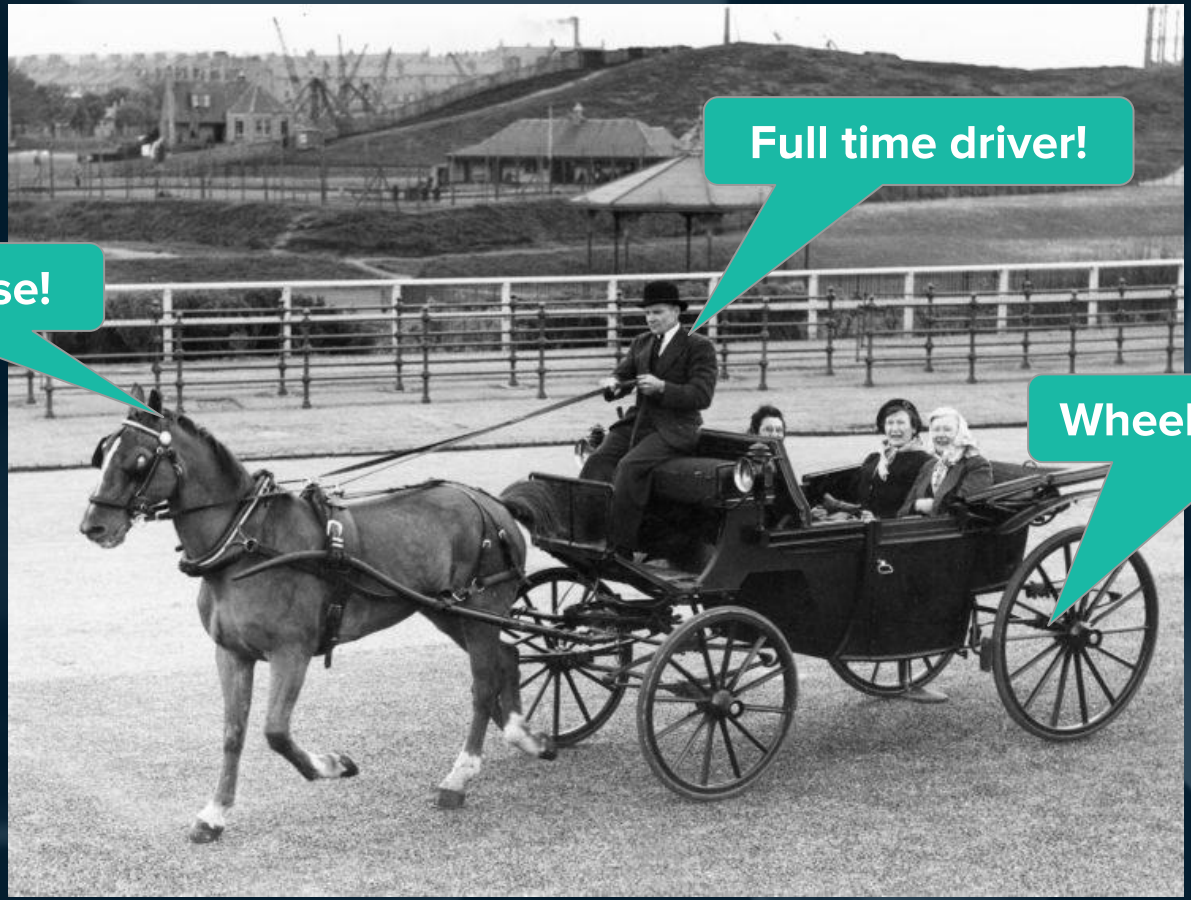
- Derrick Harris https://thenewstack.io/why-wells-fargo-repaves-its-entire-platform-every-day


Availability is important.
Security is also important.

The End



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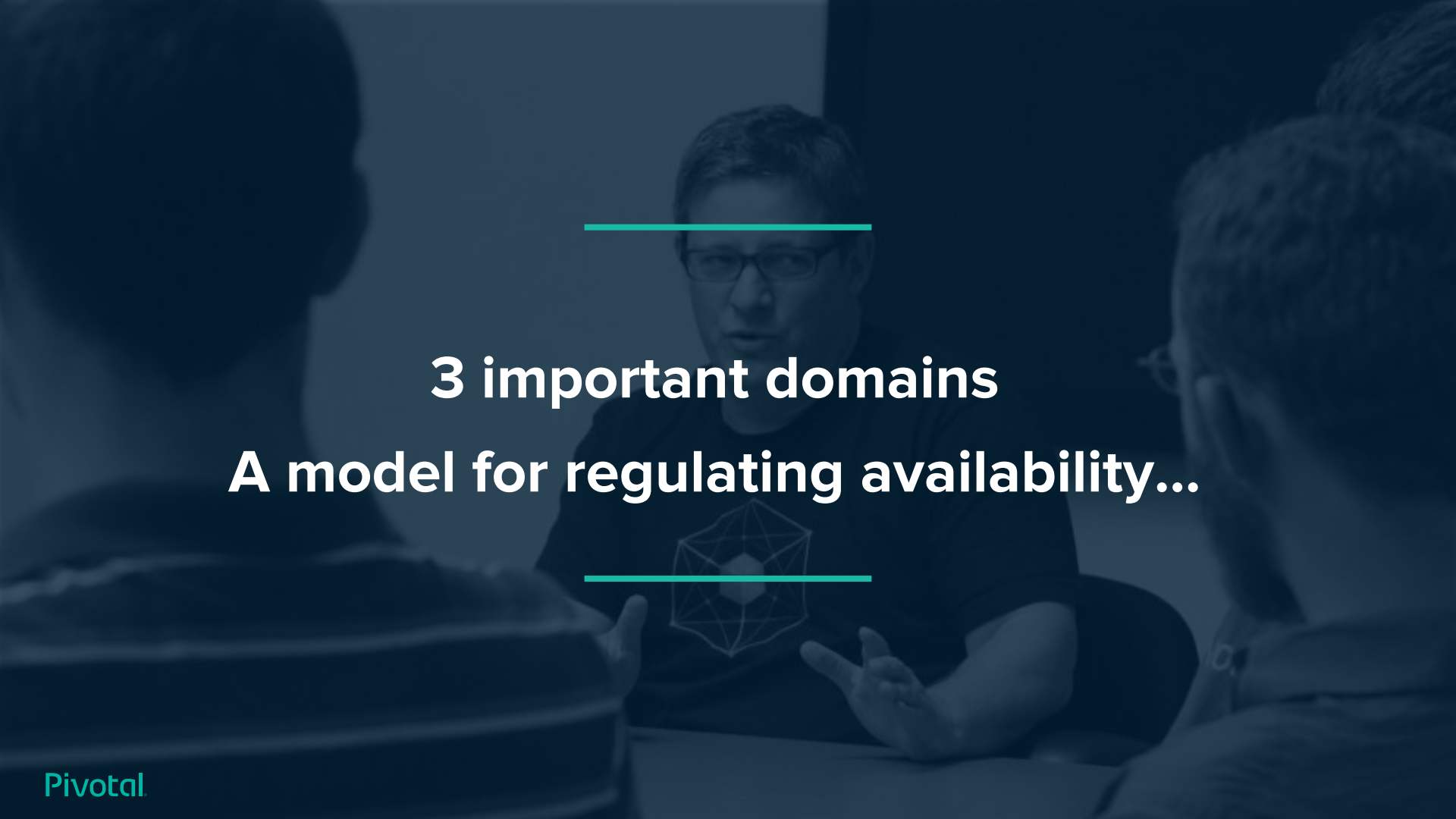
Old Faithful



NEW Faithful!

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Availability is important.
Security is important.
Feature freshness is also important.
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3 important domains
A model for regulating availability...
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Error budget model

Availability ✓

Security ?

Feature Freshness ?

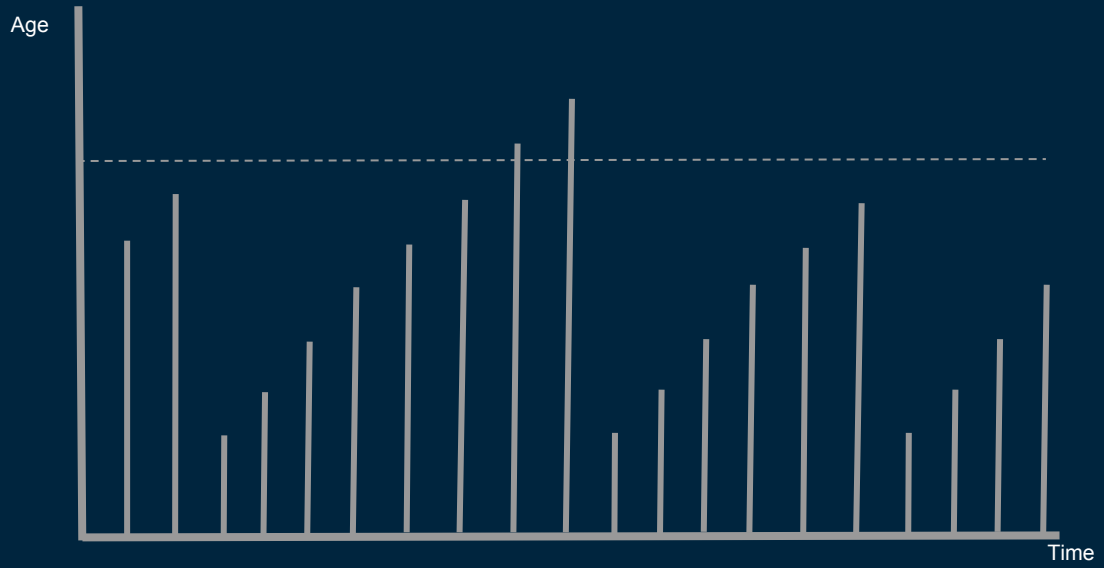
Security is important



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Vulnerability budget

How long can we afford to be vulnerable to CVEs in our dependencies?

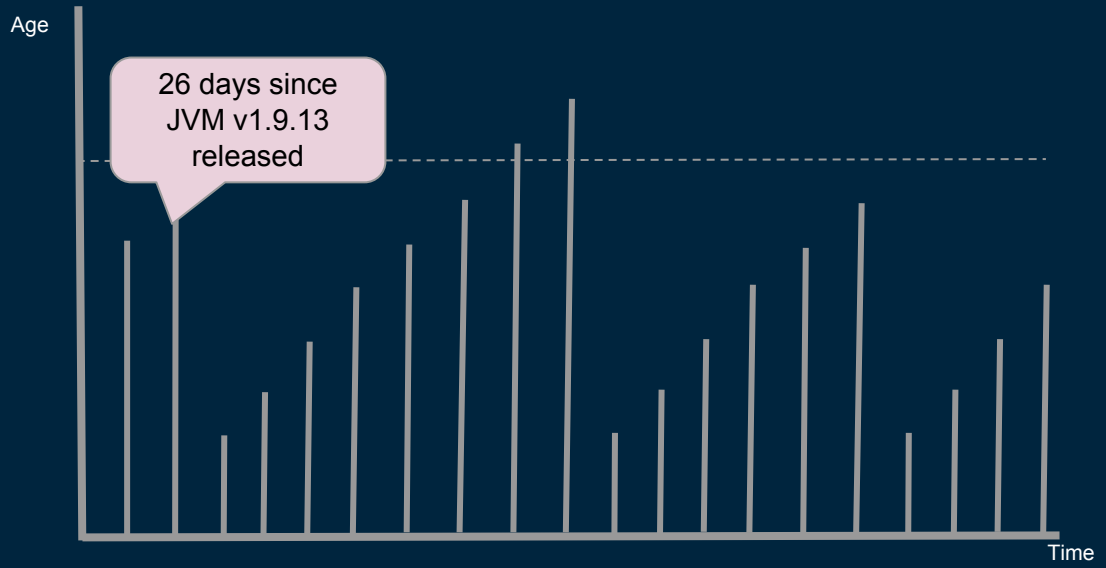


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Vulnerability budget

How long can we afford to be vulnerable to CVEs in our dependencies?

SLI - days since running dependency patch was released

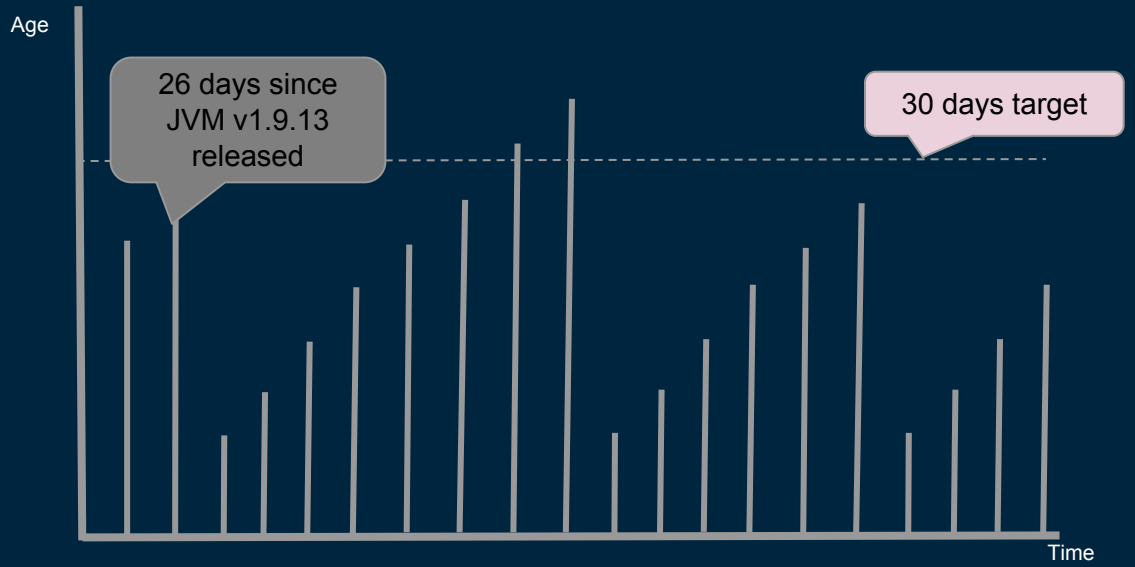


- SLI - days since running dependency patch released

Vulnerability budget

How long can we afford to be vulnerable to CVEs in our dependencies?

SLO - max age threshold in days

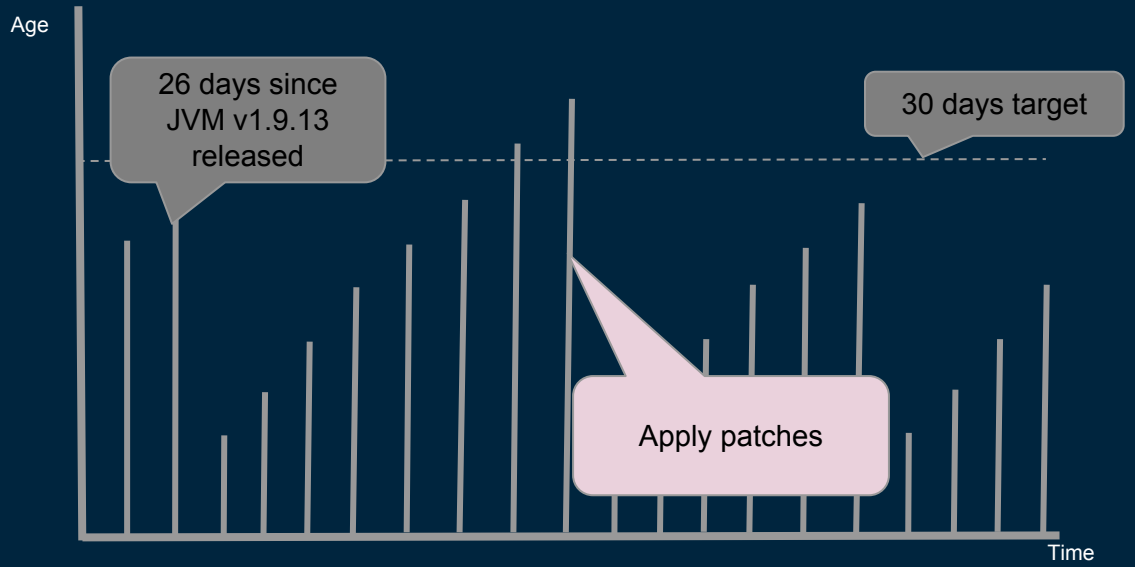


Vulnerability budget

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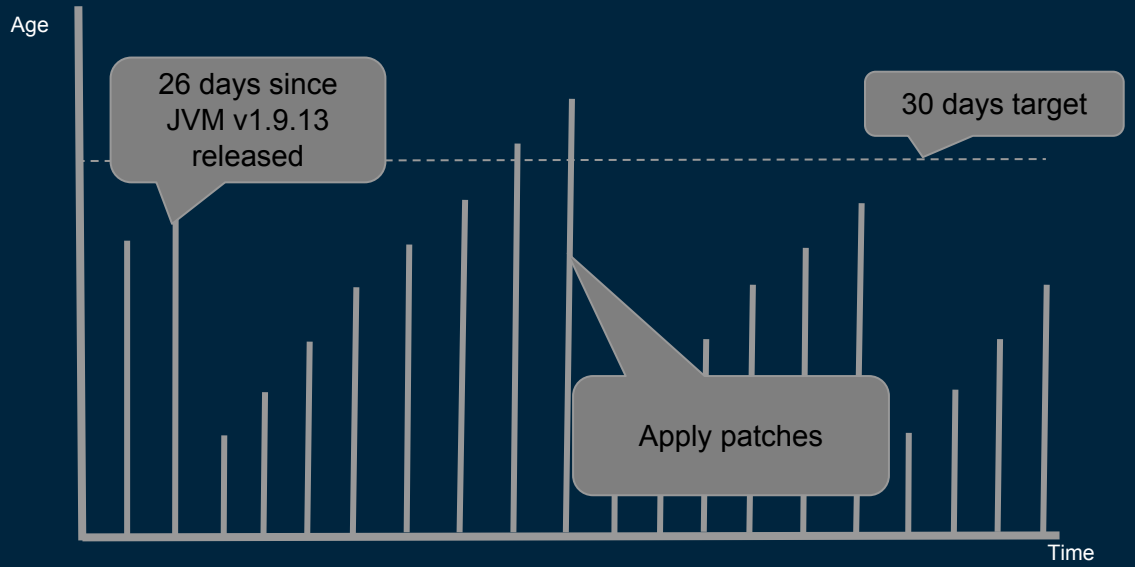
Policy - patch when near threshold



Vulnerability budget

How long can we afford to be vulnerable to CVEs in our dependencies?

- SLI - days since running dependency patch released
- SLO - max age threshold in days
- Policy - patch when near threshold




SLO threshold?
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Hypothetical Story

Names have been changed....

- Large U.S. company
- Collects *a lot* of personal and financial information
- From almost everyone
- Even if they didn’t sign up


EQUIFAX

Equifox Breach

Pretty Infamous

- 143 Million people!
- *Really* valuable personal information
- Firings/Resignations, FBI Investigation, Congressional Hearings

Equifox Breach

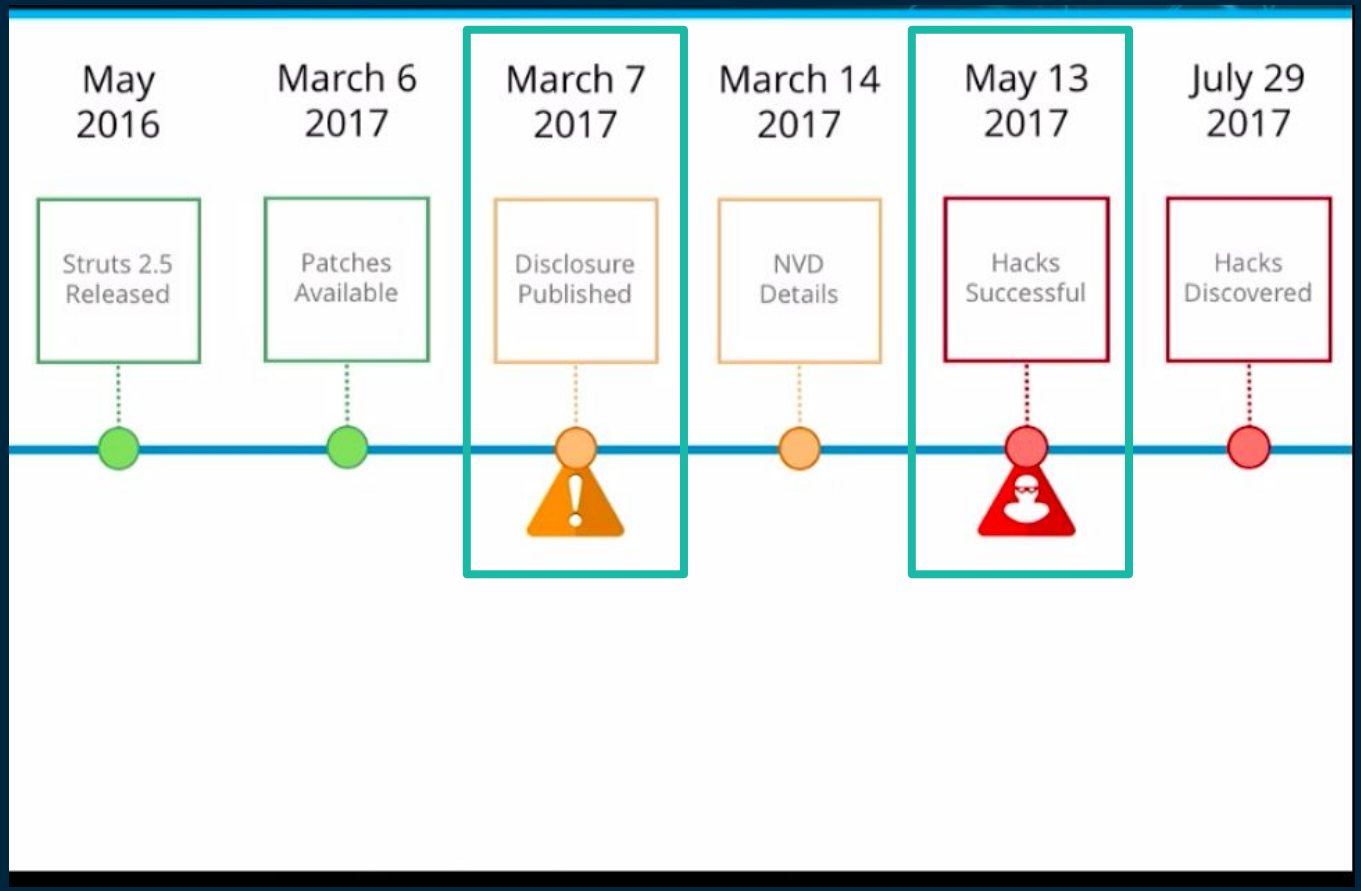
Pretty Avoidable

- Caused by a known issue in Apache Struts



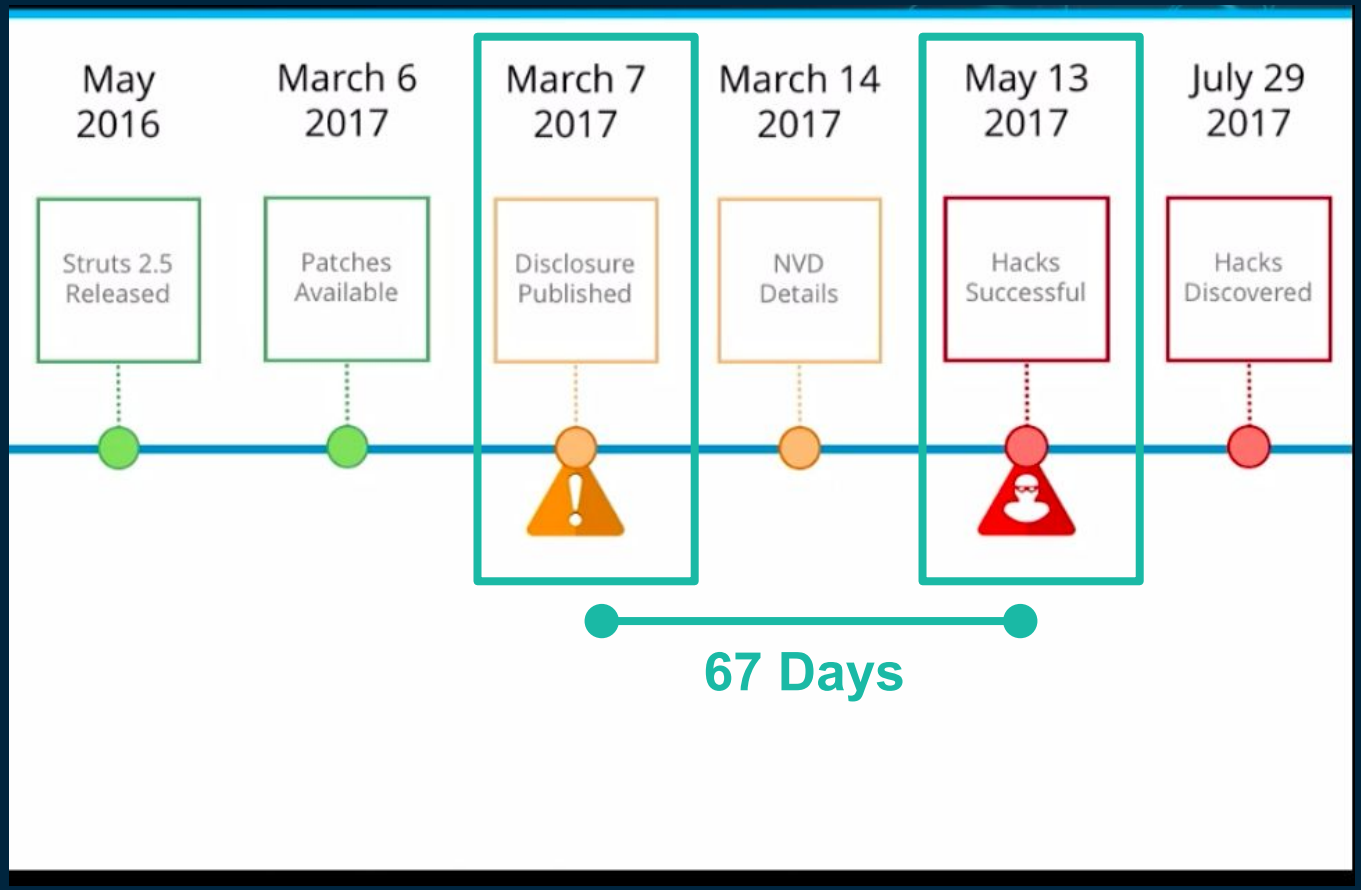
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Behind the Equifax Breach: A Deep Dive Into Apache Struts CVE-2017-5638. Patrick Carey, Chris Fearon, Pat Durante.



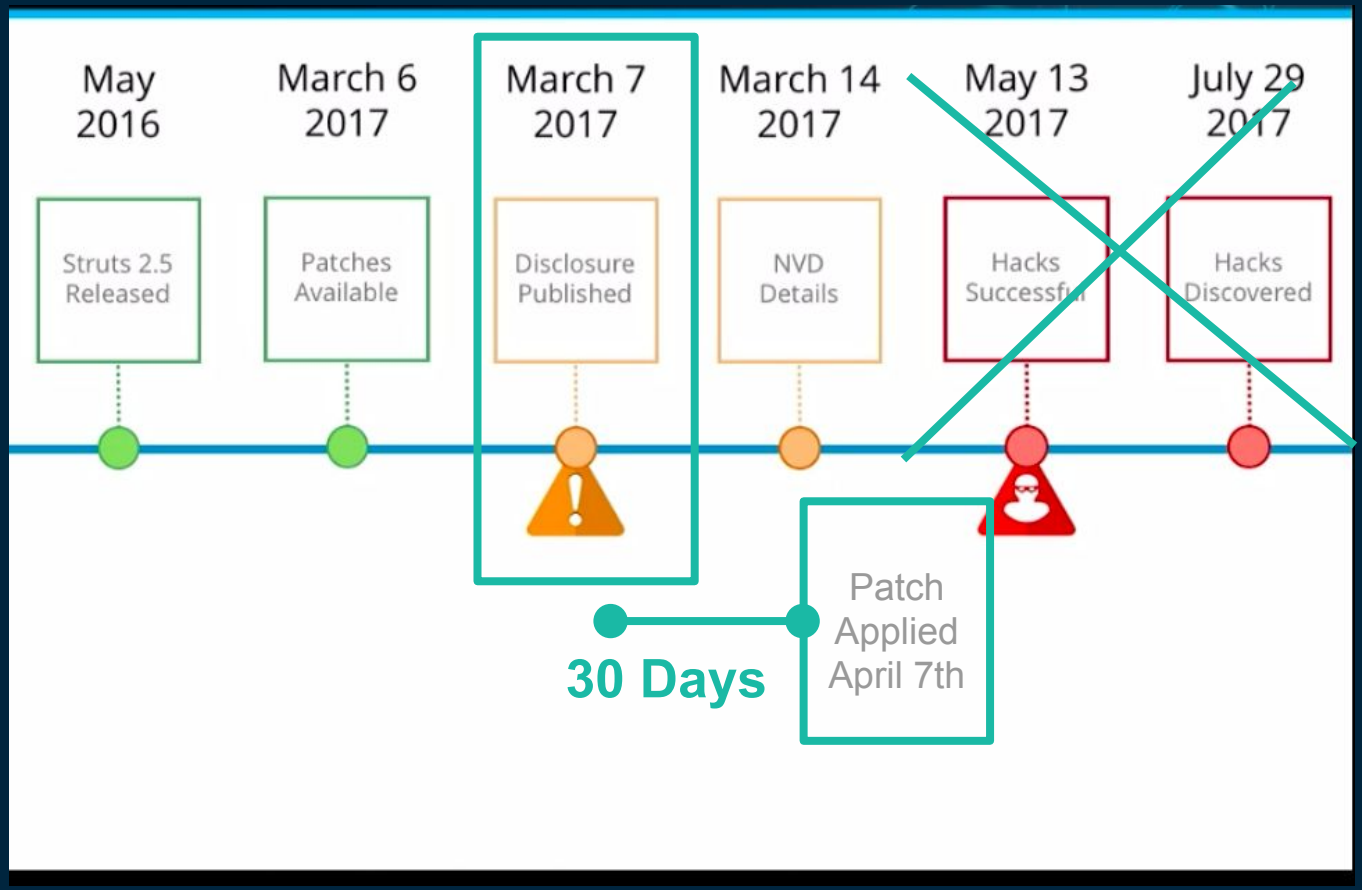
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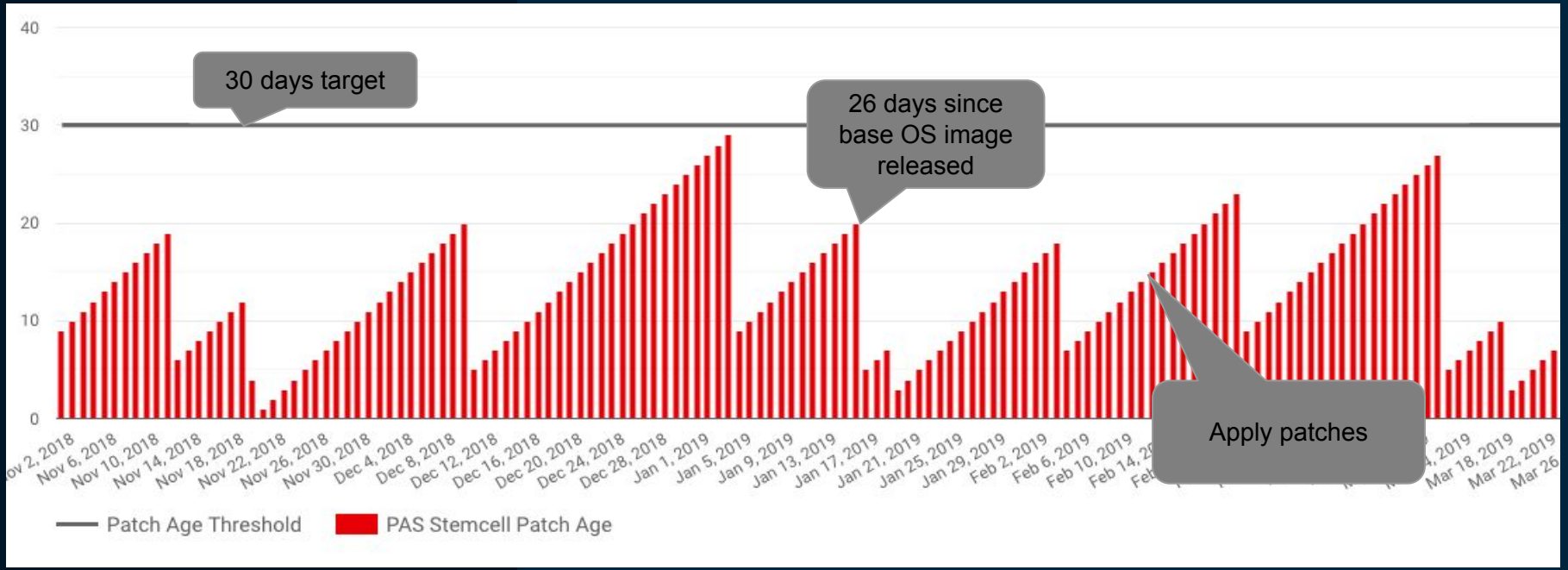
Behind the Equifax Breach: A Deep Dive Into Apache Struts CVE-2017-5638. Patrick Carey, Chris Fearon, Pat Durante.

30 days SLO would have worked for Equifox

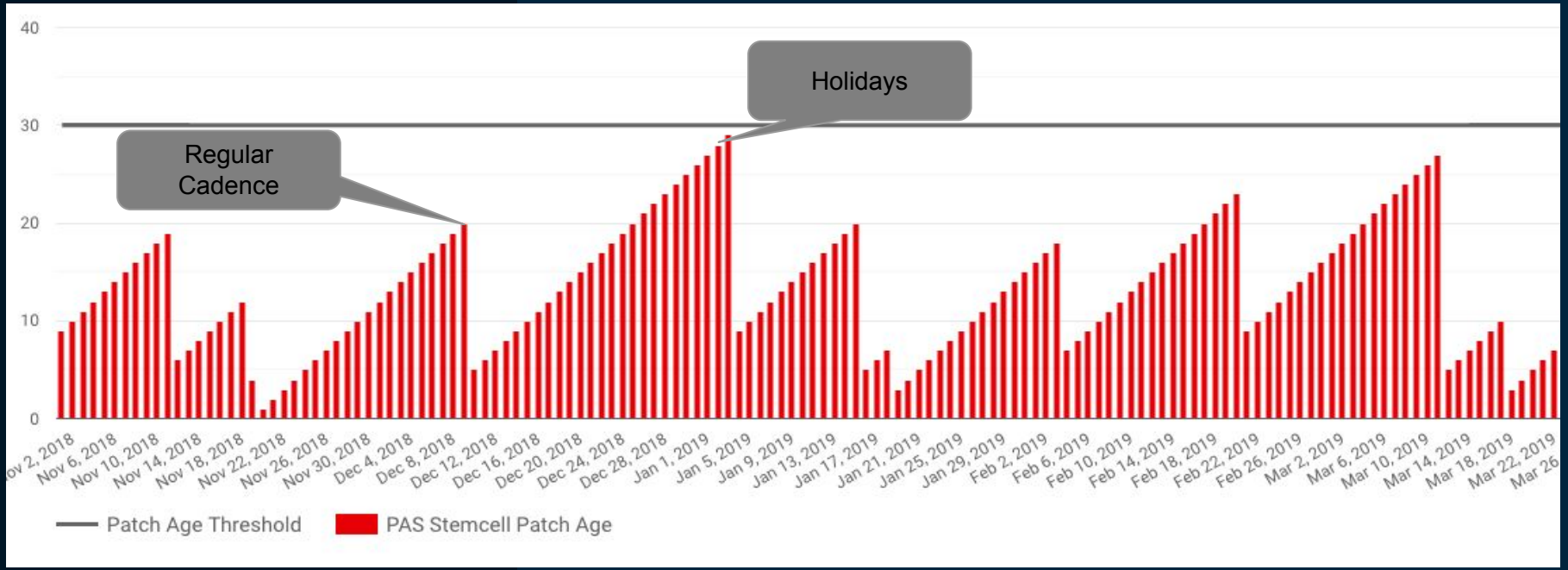
Real world example

A Pivotal teams experience over last 6 months

- SRE team running a platform for large SaaS tenant
- Patching Ubuntu OS
  - Rebuilding & repaving
- Max age threshold SLO of 30 days


40
30
20
10
0
30 days target
26 days since base OS image released
Apply patches
Nov 2, 2018
Nov 6, 2018
Nov 10, 2018
Nov 14, 2018
Nov 18, 2018
Nov 22, 2018
Nov 26, 2018
Nov 30, 2018
Dec 4, 2018
Dec 8, 2018
Dec 12, 2018
Dec 16, 2018
Dec 20, 2018
Dec 24, 2018
Dec 28, 2018
Jan 1, 2019
Jan 5, 2019
Jan 9, 2019
Jan 13, 2019
Jan 17, 2019
Jan 21, 2019
Jan 25, 2019
Jan 29, 2019
Feb 2, 2019
Feb 6, 2019
Feb 10, 2019
Mar 18, 2019
Mar 22, 2019
Patch Age Threshold
PAS Stemcell Patch Age

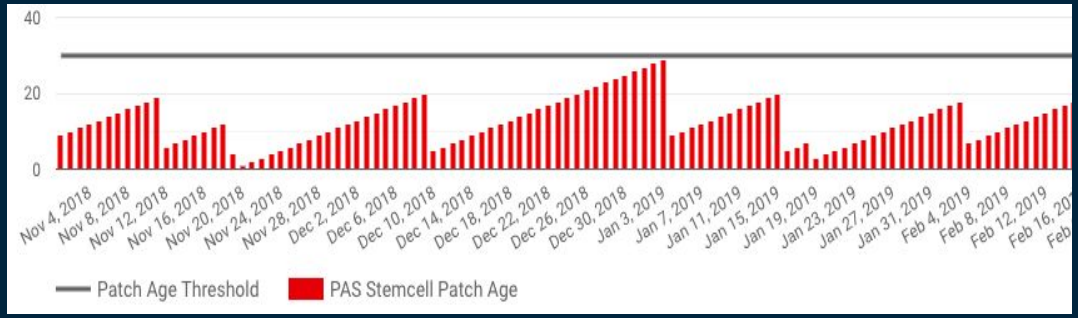
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Holidays
Regular Cadence
40
30
20
10
0
Nov 2, 2018
Nov 6, 2018
Nov 10, 2018
Nov 14, 2018
Nov 18, 2018
Nov 22, 2018
Nov 26, 2018
Nov 30, 2018
Dec 4, 2018
Dec 8, 2018
Dec 12, 2018
Dec 16, 2018
Dec 20, 2018
Dec 24, 2018
Dec 28, 2018
Jan 1, 2019
Jan 5, 2019
Jan 9, 2019
Jan 13, 2019
Jan 17, 2019
Jan 21, 2019
Jan 25, 2019
Jan 29, 2019
Feb 2, 2019
Feb 6, 2019
Feb 10, 2019
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Real world example

A Pivotal teams experience over last 6 months



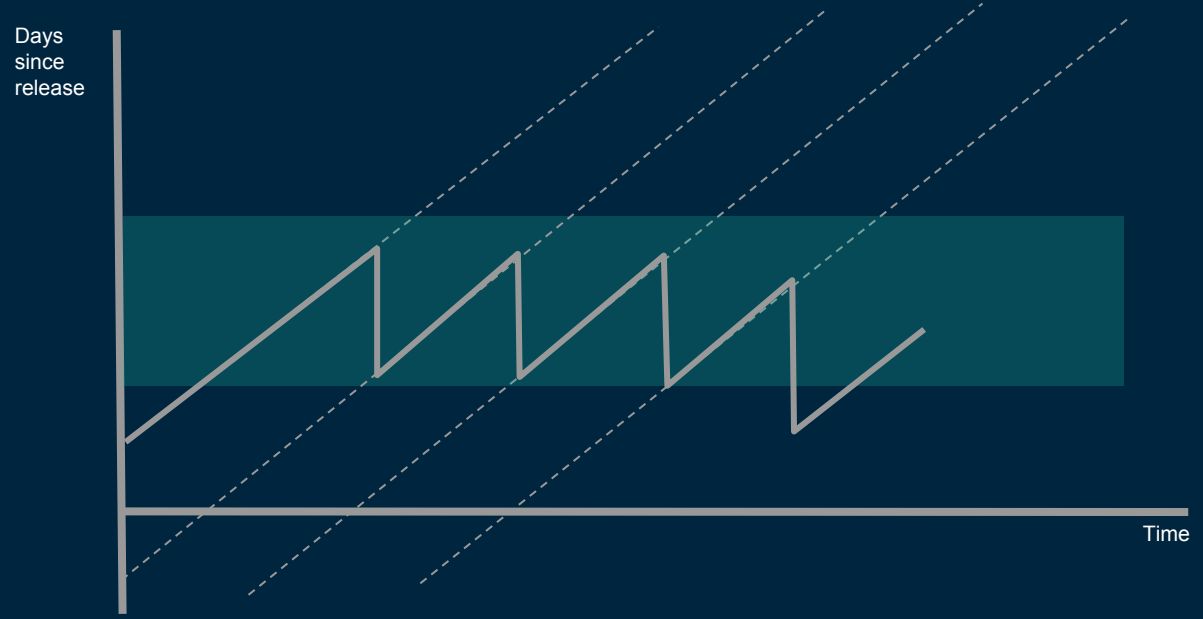
Team Can Broadcast Value They've Delivered


Feature freshness is important

Legacy budget

New enough that it gets support; and not so old that no-one wants to use it

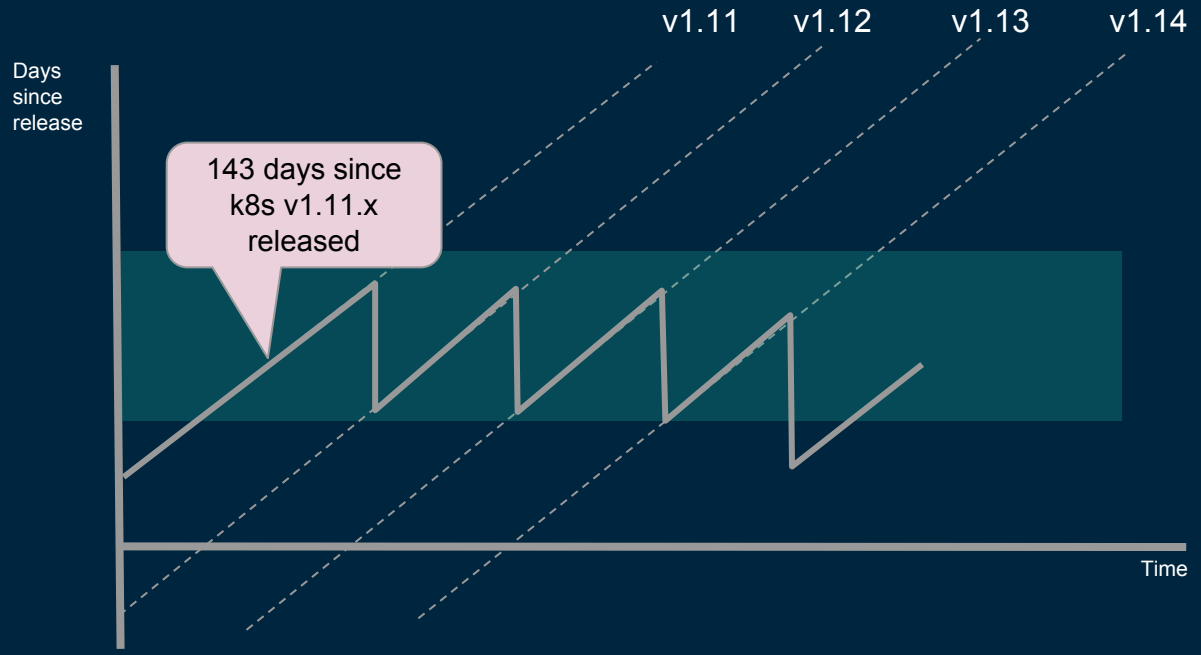
- Which version of k8s should one run?
- Given:
  - New release ~ every 90 days
  - N-2 support policy



SLI - days since feature release

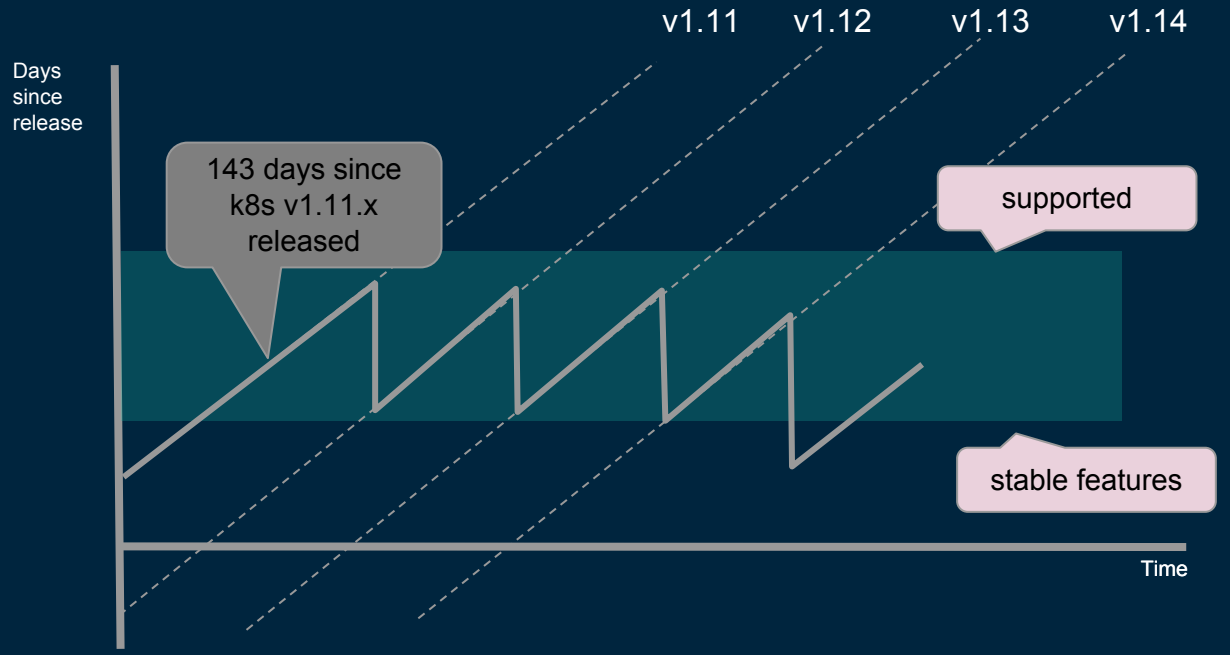
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- SLI - days since feature release

SLO - a range that describes how bleeding edge you want to be



Legacy budget

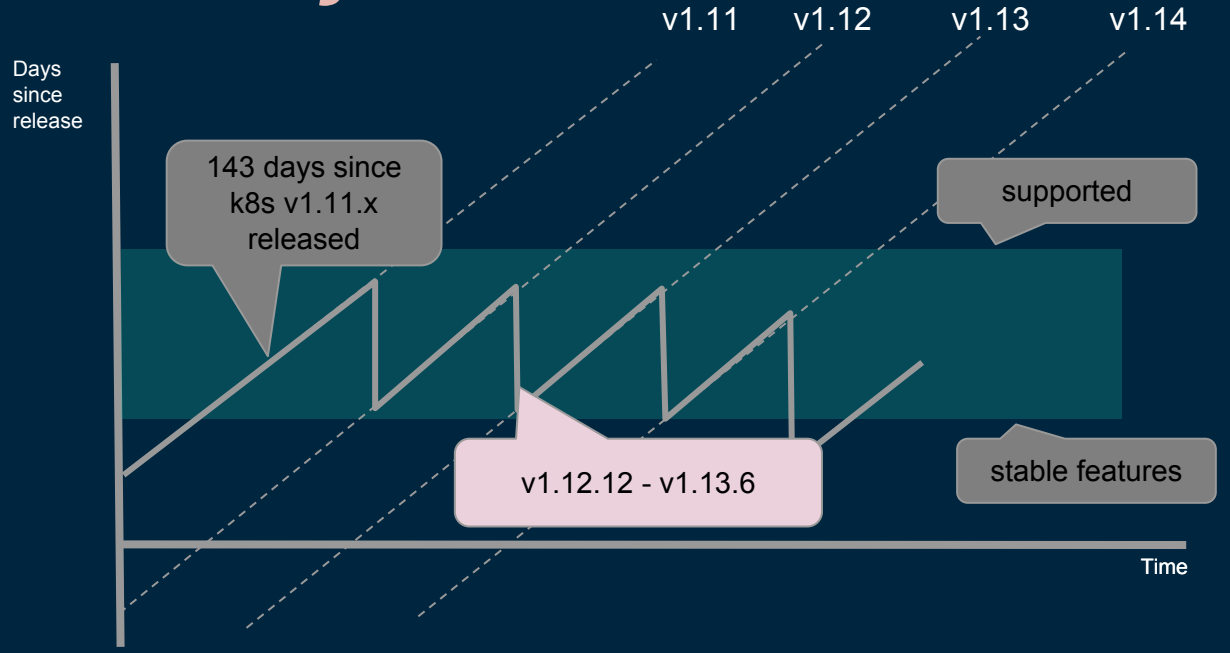
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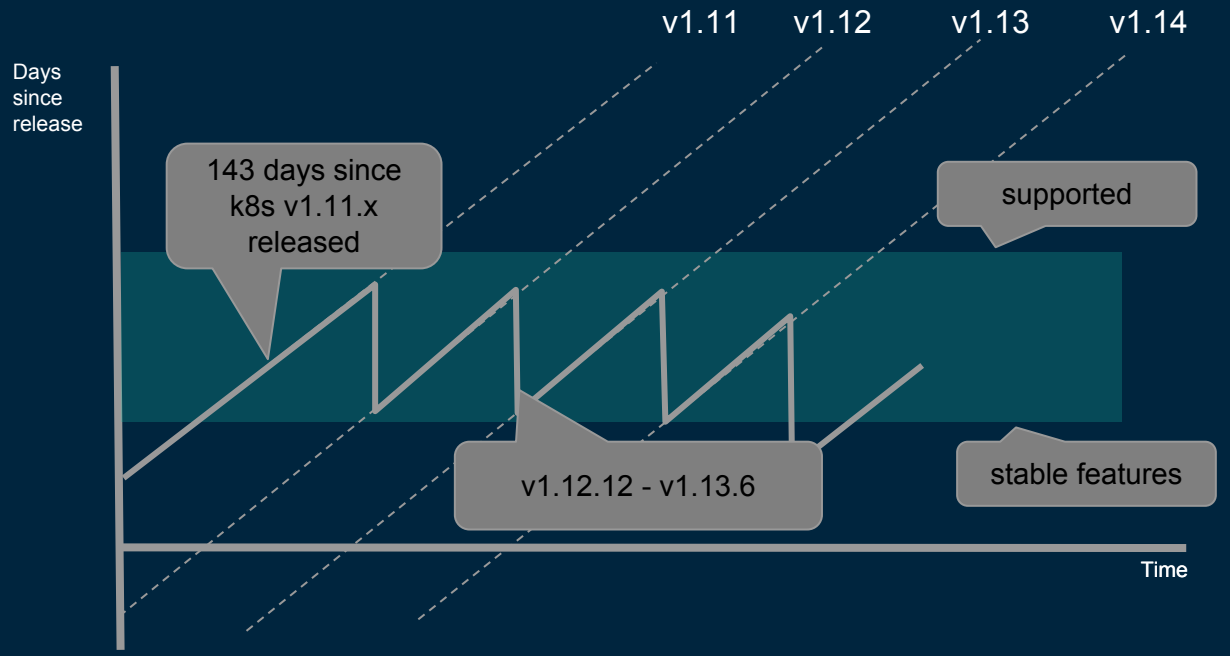
Policy - upgrade every 90 days



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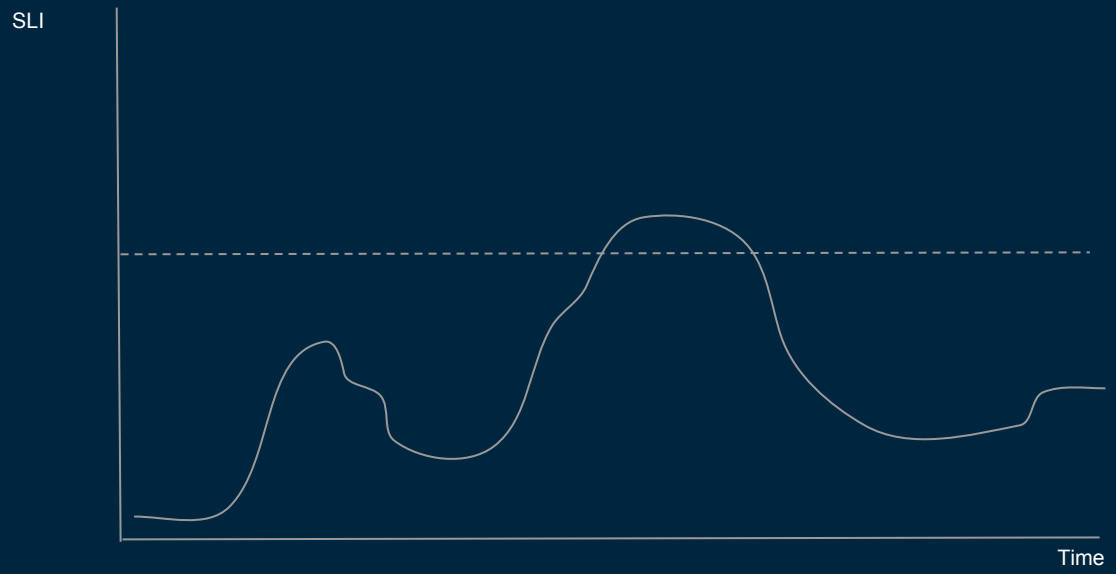
Recap:

Budget model:

- Availability
  - Error Budgets ✓
- Security
  - Vulnerability Budget ✓
- Feature Freshness
  - Legacy Budget ✓

The Model is the same for each

A life changing approach to achieving operating balance



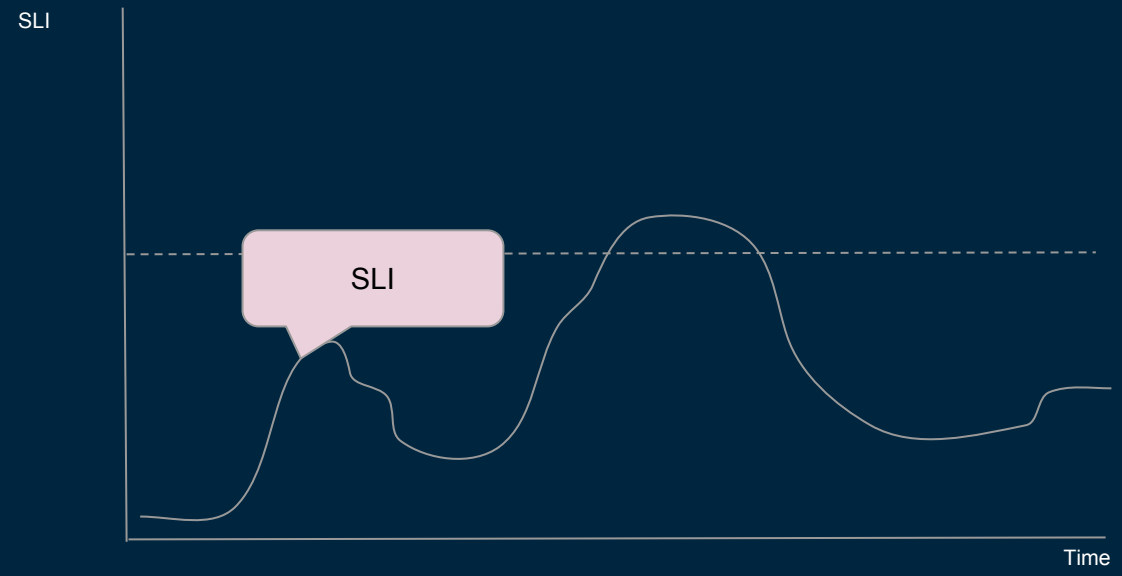
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SLI - Service Level Indicator

- a measurement of user value delivered



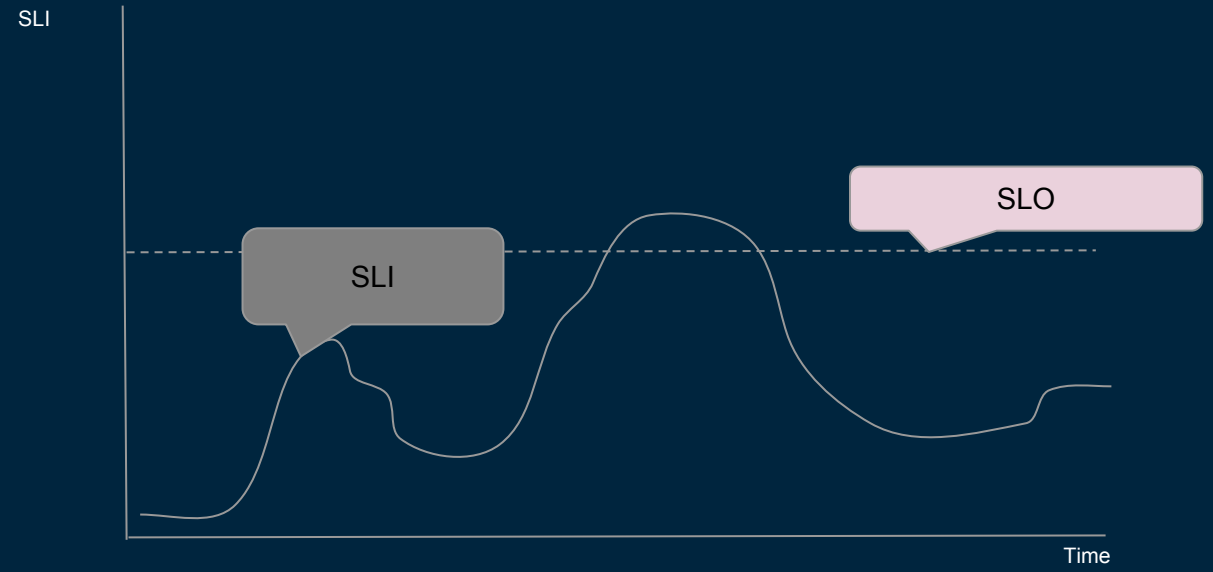
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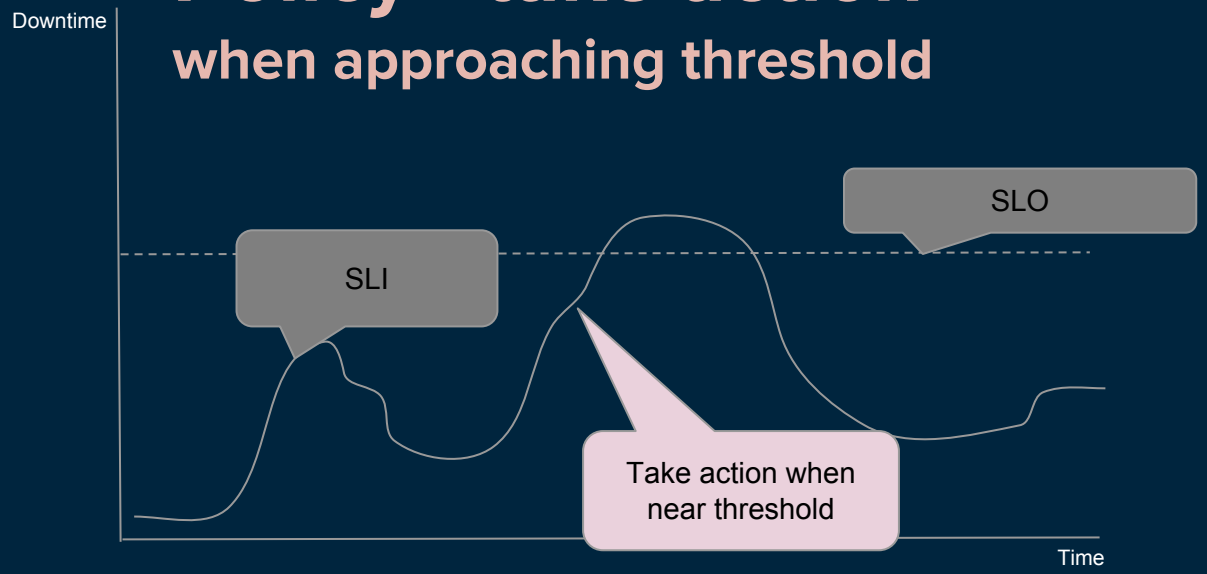
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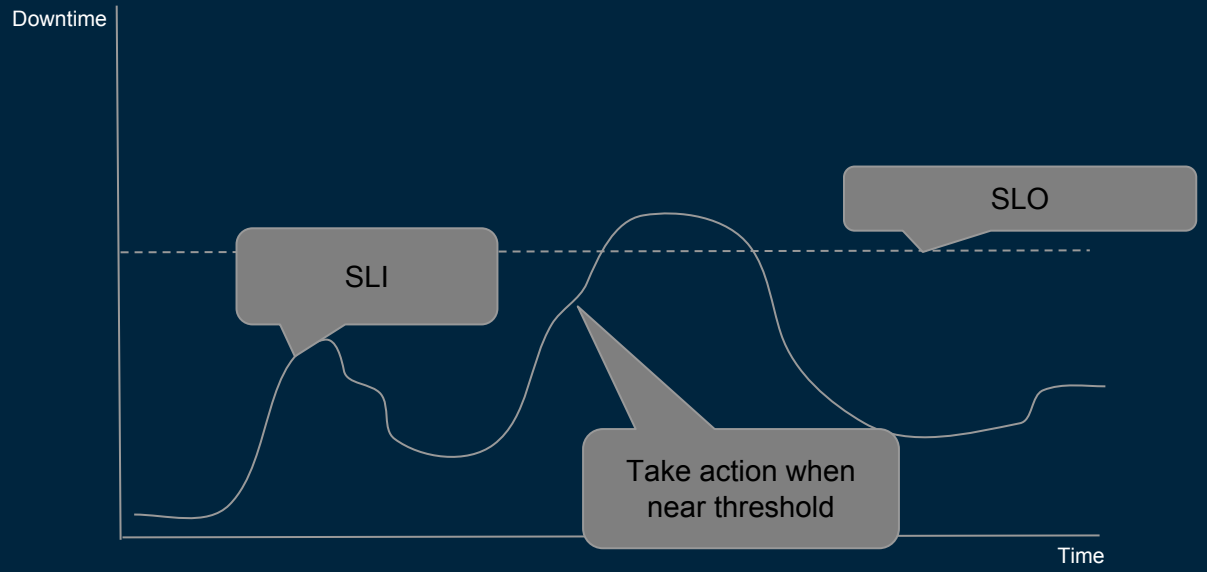


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The End



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The End
(of this talk at least)
Further conversation & Q&A
#srecon_americas