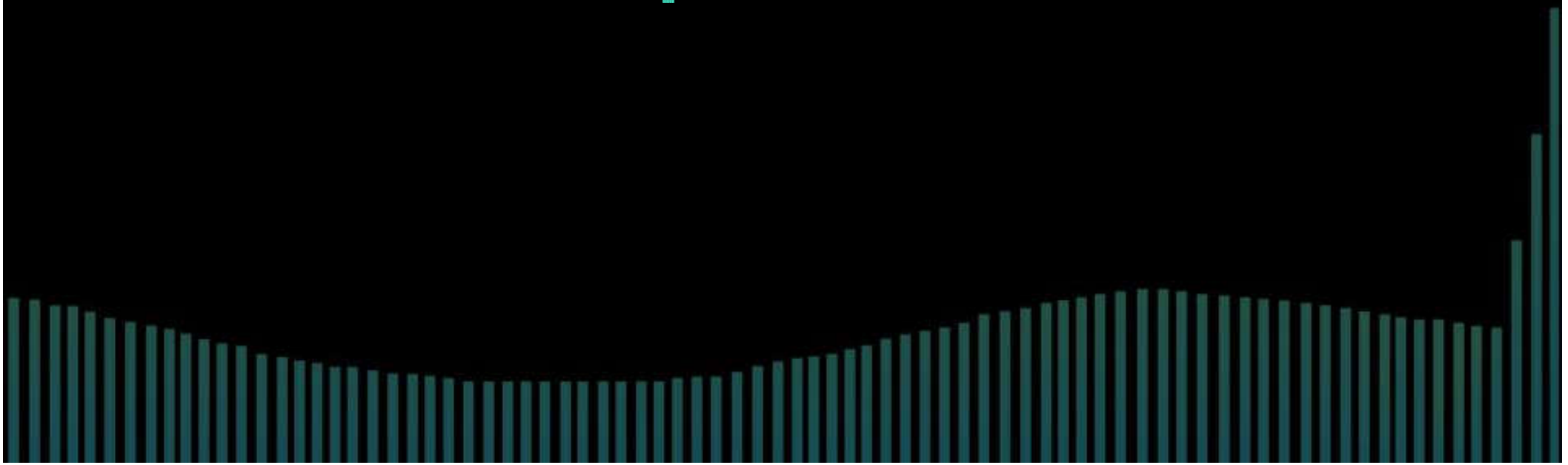
C++ Summit 2020

Dori Exterman
Incredibuild CTO

4 Software Development Predictions for 2021



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CPP-Summit 2020

C++ Summit 2020

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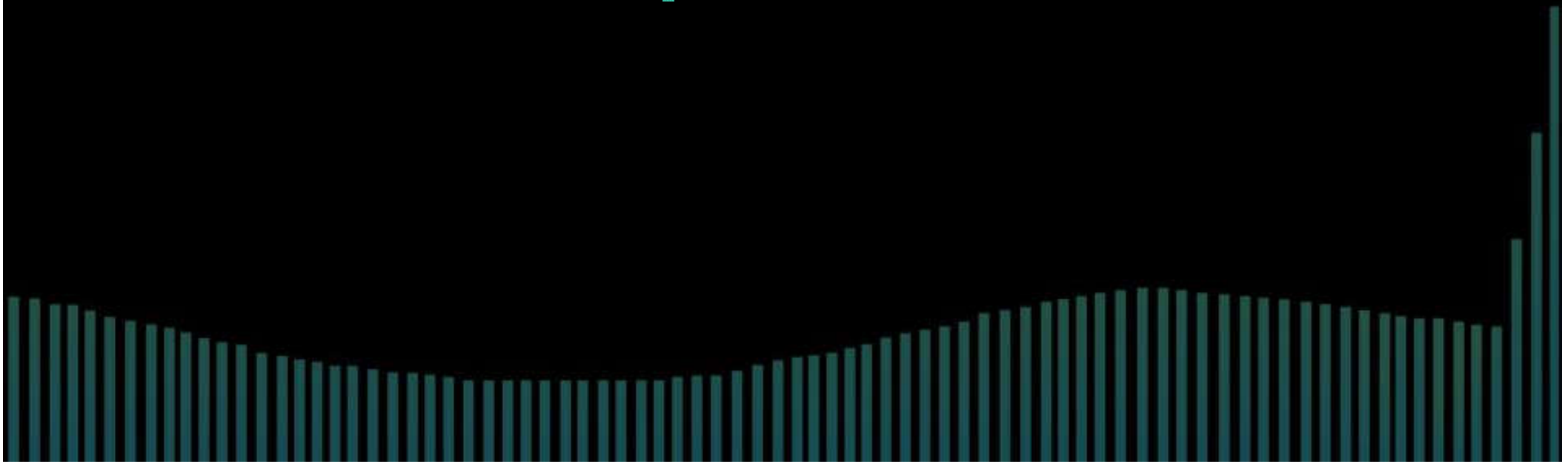
How to Push Enterprises Over the Dev Speed Limit



2020
Agile is no longer a trend

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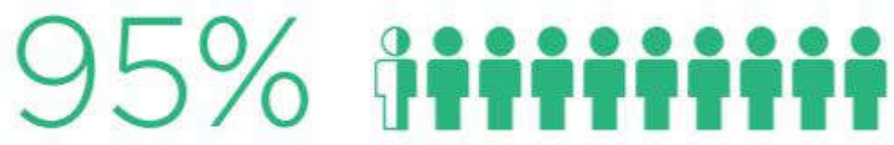
2020
Agile is the standard

HOW MANY STARTUPS USE AGILE?
95% of respondents report their organizations practice agile development methods.
2019



(From: **State of Agile Report**)

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Advantages of agile for enterprises

- Faster time to market
- Quicker update release (improved quality)
- More frequent iterations
- Better cross-company collaboration
- Minimize resource waste

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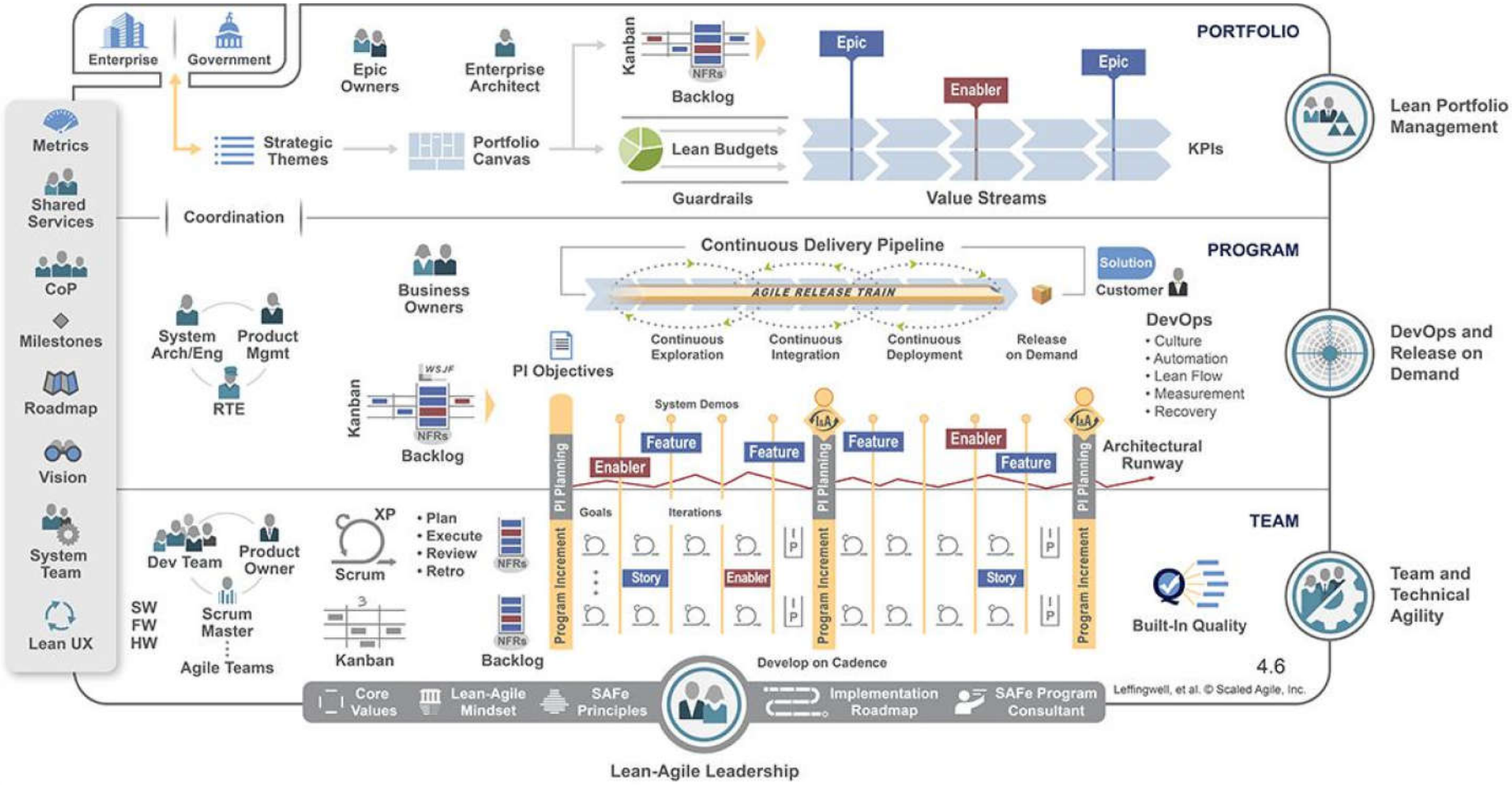
Super complex implementation flow:



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The main 3 principles of Agile

The *Manifesto for Agile Software Development*

- Customer satisfaction by **early and continuous delivery** of valuable software.
- Welcome **changing requirements**, even in late development.
- Deliver working software **frequently** (weeks rather than months)

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Agile pre-requisites

- CI\CD Automation
- Automated test coverage
- Fast dev cycles
- Frequent iterations

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4 speedy predictions
for enterprises

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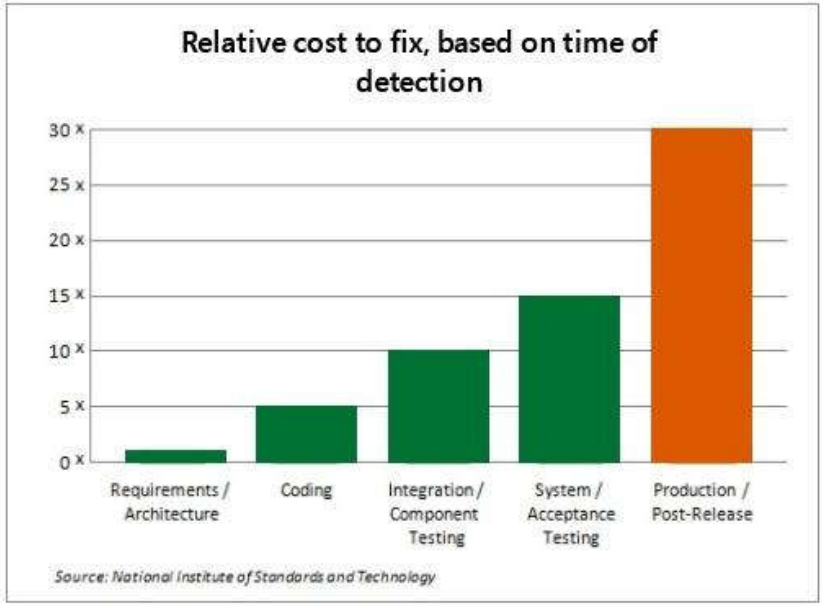
Two mega trends

- **Shift-left**
  - find and prevent defects early in the software delivery process
  - improve quality by moving tasks to the left as early in the lifecycle as possible
- **Cloud transformation**
  - the process of moving your work to the cloud



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Chellenges Enterprises are facing
Adopting Agile practices

- Code inflation
- Technical debt in testing
- Limites test coverage automation
- Slow and in-frequent dev cycles
  - From nightly builds -> intra-day -> build per commit

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Code inflation

> Over half (51%) of software development stakeholders report they have **more than 100 times the volume of code they had 10 years ago.** And a staggering 18% say they have 500 times more code.

From: **The emergence of big code**
(Sourcegraph + Dimensional Research)

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Problem #1
Test-coverage technical debt

- Heavy burden on manual QA
- Bugs are found late in the development cycle
- In-frequent releases
- Product quality issues

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Prediction #1

AI-based test generation will make testing faster and better

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Prediction #1

AI-based test generation:

Harvest Artificial Intelligence automation to catch up with technical debt

- Catch errors, bugs, and regressions early and often
- Streamline CI pipelines, improving lead time and deployment frequency
- Integrate with more confidence and increase product quality

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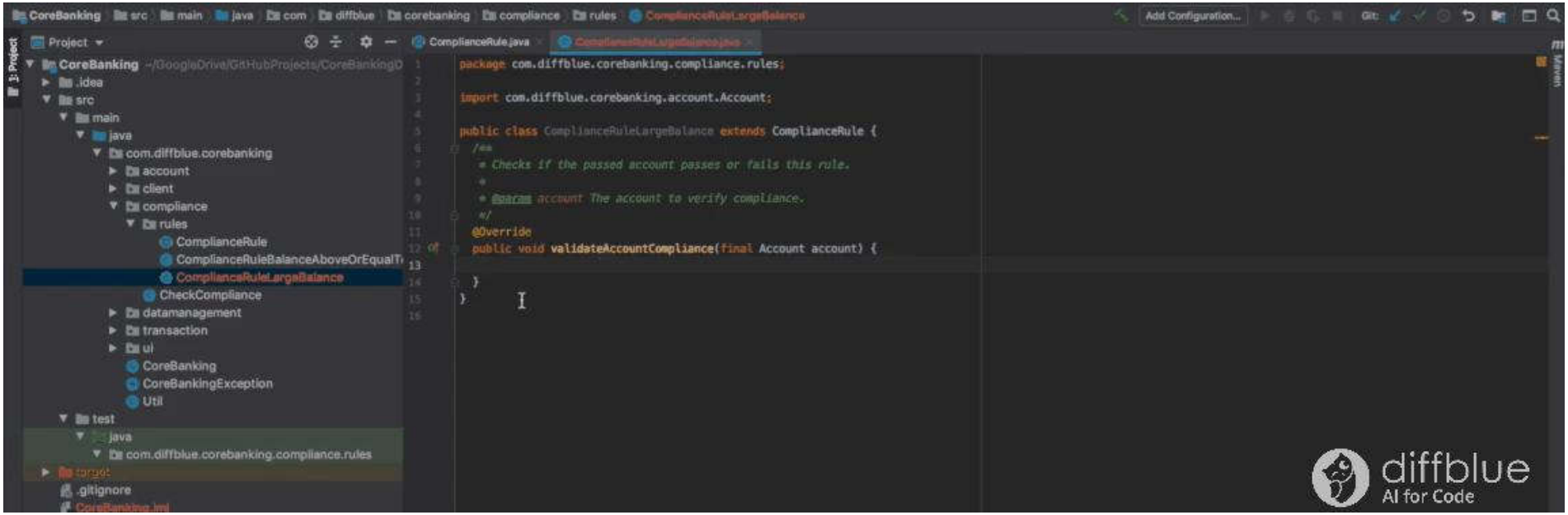
diffblue
AI for Code



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Additional players

- Testim.io
- InteliTest
- PoniCode

Automated test generation for C++ code is more complex than for intermediate languages (c#, java) or script languages such as java script.

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Problem #2
Full test execution can take hours

- Good code coverage can lead to hours of test execution
- Testing each commit can be impossible
- Not testing each commit leads to "who broke the build" long resolution
- Running hours of test frequently is very costly

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Prediction #2

Test avoidance tech will make a dent in unnecessary testing

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Why avoidance?

Test automation means test inflation:

- Unit tests
- API
- Integration tests
- Regression tests
- End-to-end tests
- Sanity
- Fuzzy testing
- DevSecOps

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> I have a small change.
> **Why do I need to run all the tests?**
>
> - Every developer

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Kohsuke Kawaguchi

Jenkins | CloudBees.

> As software development becomes bigger in scale, this [testing] waste costs millions of dollars and countless hours of developer time.

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Launchable

Machine learning in test automation tooling to identify tests that matter.

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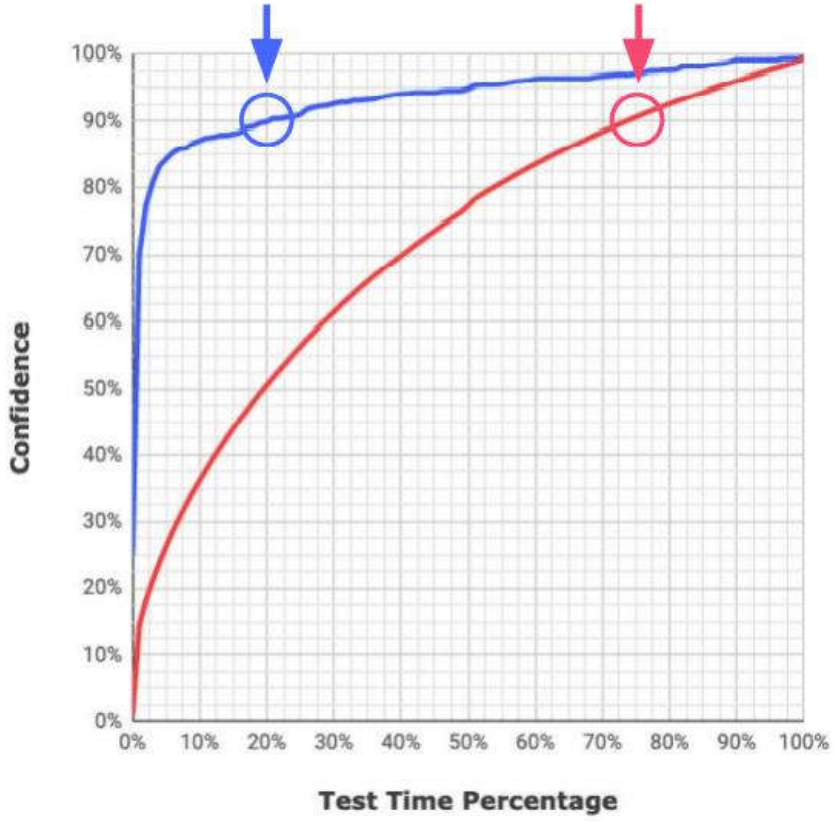
Launchable success story

A leading car manufacturer



Baseline

90% Confidence

75% Tests Selected

With Launchable

90% Confidence

20% Tests Selected

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Launchable success story

A leading car manufacturer

Impact

Hours Saved	Dollars saved	ROI	People	Hardware Capacity
15.6k	$998k	2010%	8	3x

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But in the meantime

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Problem #3
Slow and in-frquent build time

- Large code base
- Time-consuming test execution
- Additional build steps (code anlaysis, packaging, signing)
- Nightly or periodic builds lead to:
  - Long "who broke the build" resolution process
  - Not having a working version on a daily basis

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Prediction #3

High-performance computing

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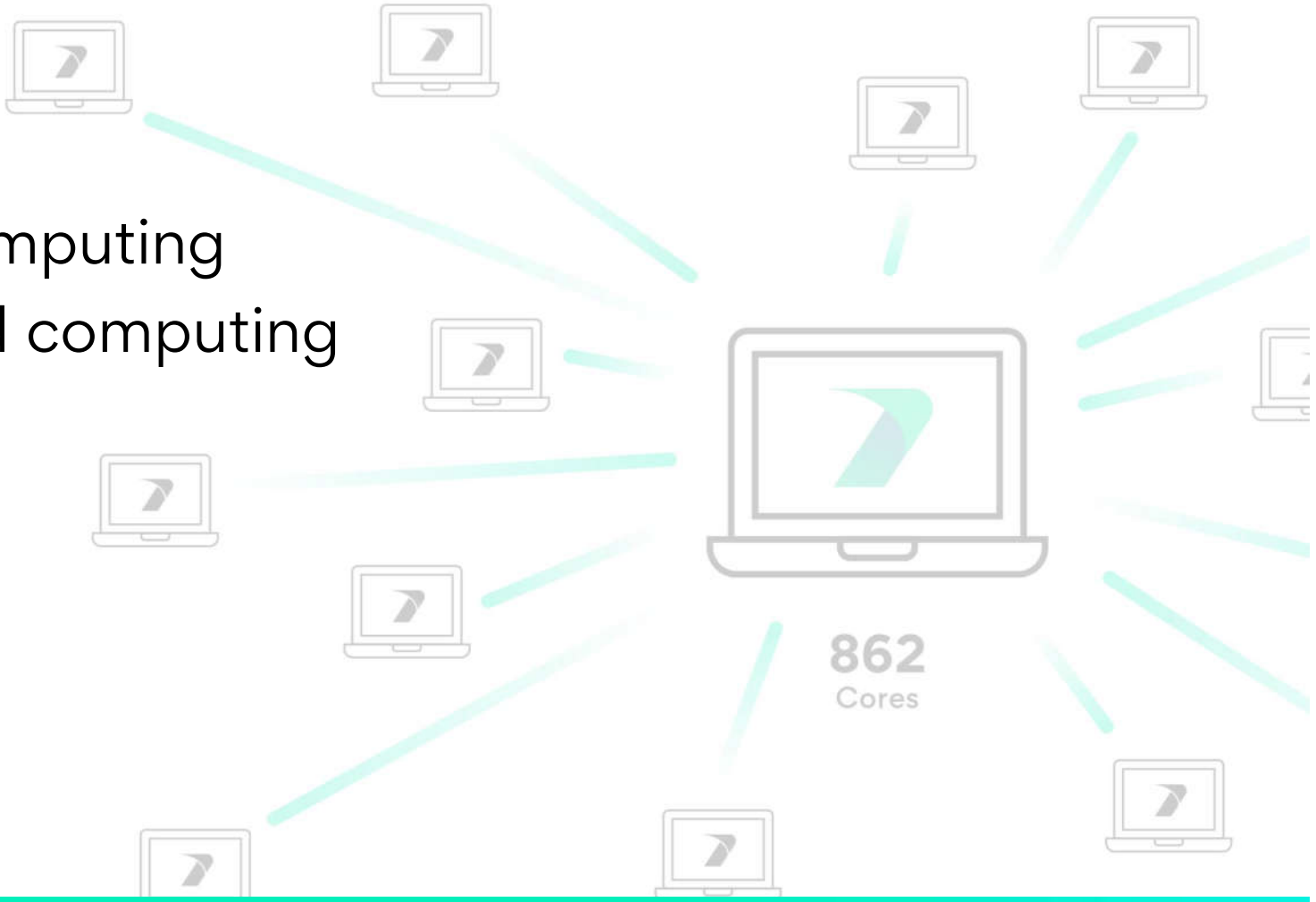
Possible solutions for harvesting more processing power

- HPC
- Cluster computing
- Distributed computing



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Minitab®

Automated test execution using distributed computing

- Transform each build host into a super computed with hundreds of cores
- Scale-up/down seamlessly and on-demand
- Use simultaneously on-prem and in the cloud
- No IT overhead

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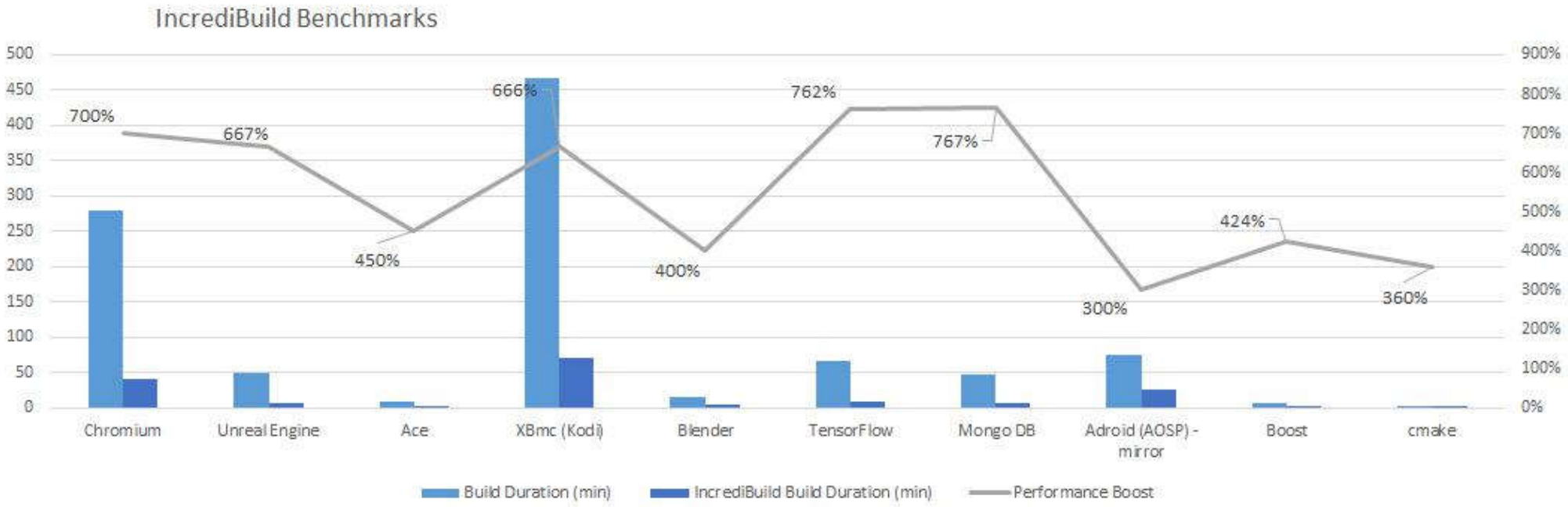
C++ GitHub projects compilation accelerated with distributed computing



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Prediction #4

Managed CI/CD in the cloud will automate release pipelines

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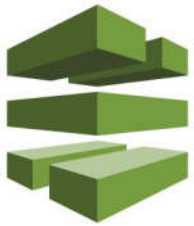
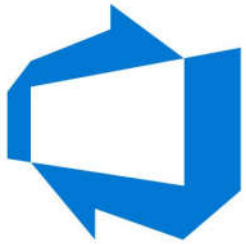
Multiple players in the startup space



AWS CodePipeline



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Benefits for CI/CD in the cloud for enterprises:

- Scale-friendly
- Secure
- Faster onboarding
- IT managed
- Simple repository creation
- Seamless work across geos

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Additional cloud-transformation soltuions:

- Cloud repositories (GitHub, GitLab, Perforce cloud)
- Cloud builds for develoeprs (GitHub codespaces)
- Virtual Cloud desktops
- SaaS testing – Applitools
- Work from home bandwidth optimization – Teradici
- And more…

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Before you push your enterprise over the speed limit...

Assess your resources and priorities

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Enterprise ≠ Slow

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C++ Summit 2020

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Thank you!

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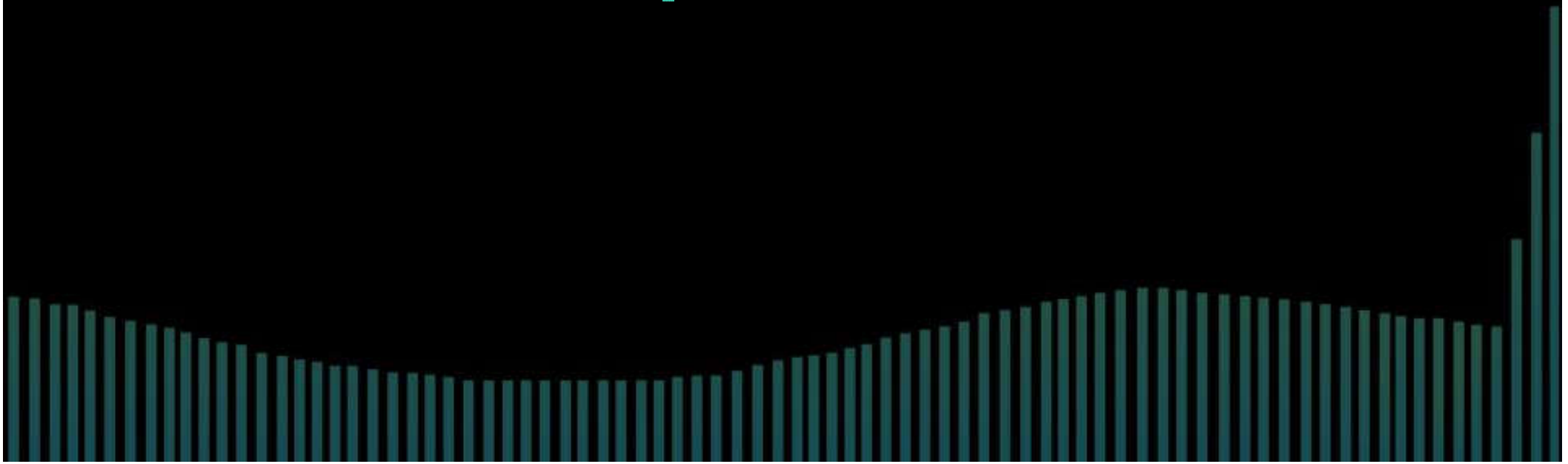

CI/CD in the cloud

Honed by startups – adopted by enterprises

> What's different with cloud is we can deliver business value **at a speed never achieved before.**

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