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PRT224

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Overcoming migration hurdles with CircleCI and AWS Graviton

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Your speakers



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Today you'll learn

- Challenges of software today
- Tools and strategies to help with migrating and scaling in the cloud
- How Honeycomb cut costs and improved speed by 50% (with steps)

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Software delivery today

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Everyone wants to go fast

In software delivery, it's clear that speed is important

When software teams move fast, good things can happen for the business



4–5x
revenue growth



60%
increase in shareholder returns



20%
improvement in operating margins

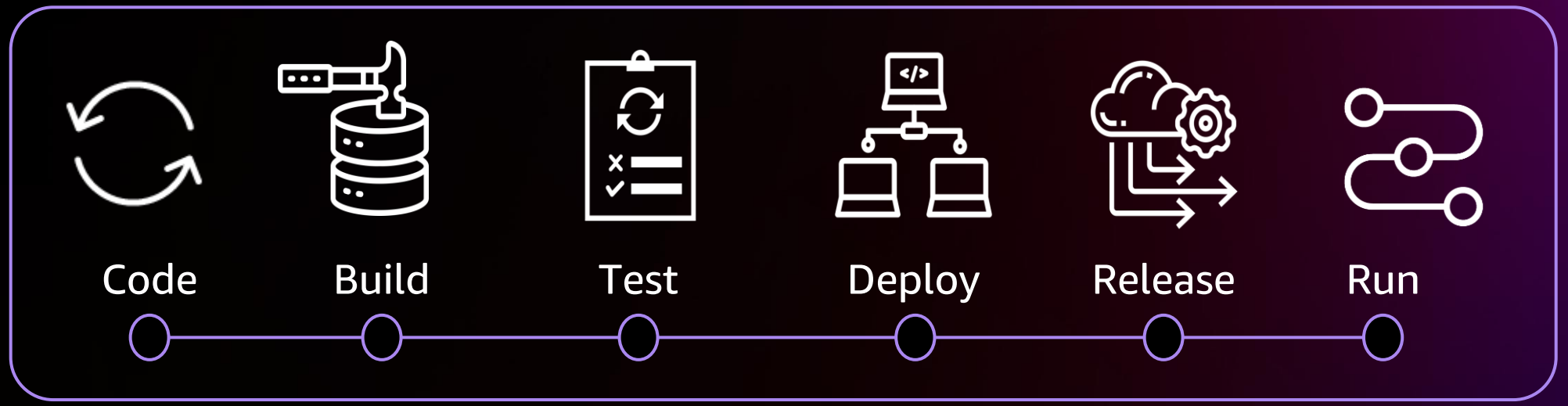


55%
increase in innovation

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Source: McKinsey, "Developer Velocity: How software excellence fuels business performance," April 2020 – mck.co/3grcMZM

The problem: Software teams want to move faster but can struggle to do so



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Software development today has dramatically changed

EVOLUTION OFTEN COMES AT THE COST OF EVER-INCREASING COMPLEXITY



Original codebases

Replacing internal code with open source

Breaking the monolith into microservices

Replacing internal services with third-party services

External platforms, applications, codebases

Software development origin

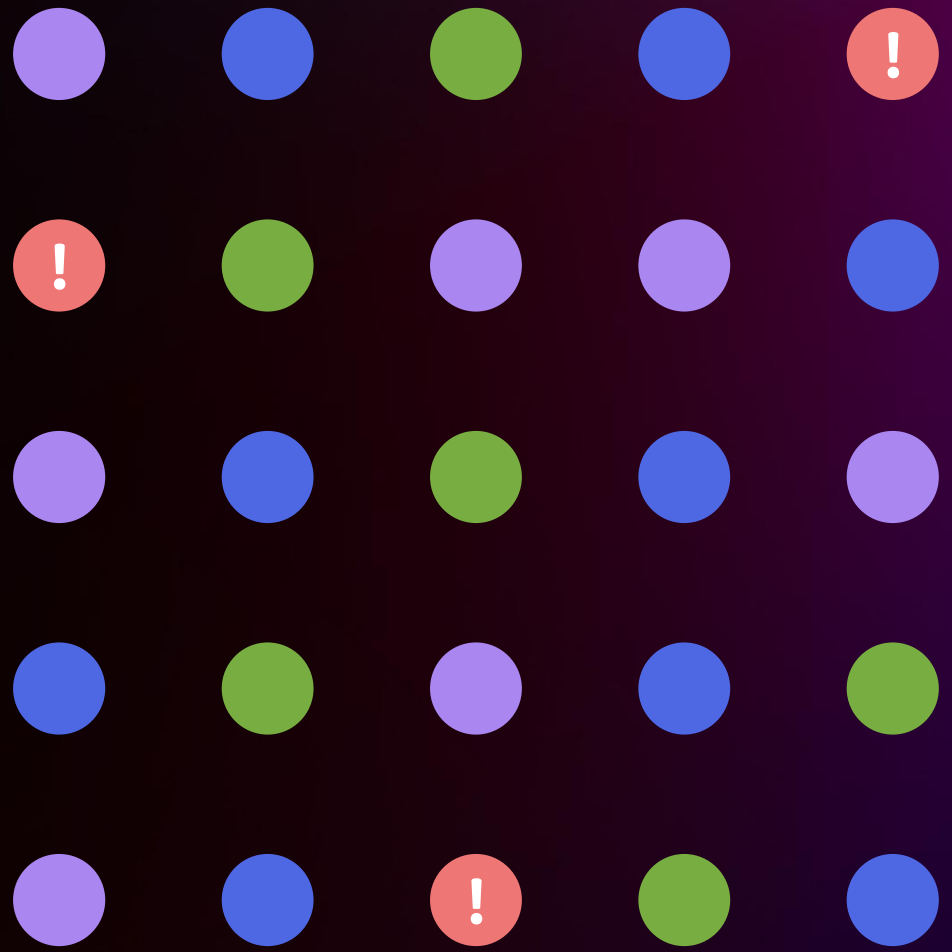
Today's starting point for cloud-native companies

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The speed and complexity tradeoff

Teams can move faster, but fixing inevitable failures becomes difficult



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This is hard

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Speed

Challenges

Pressure to deliver: Too much short-term urgency

Lack of feedback: Validation takes too long

Toil: Too many manual tasks



Scale

Challenges

Lack of visibility into the complete system

Team skill set or lack of expertise

Internal bureaucracy: Too many teams, too many approvals needed



Cost

Challenges

Waste: Time spent building the wrong things

Security: Hard requirements, review process, or checks and balances

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We have good news

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AWS: Broadest and deepest compute functionality

CATEGORIES

General purpose

Burstable

Compute intensive

Memory intensive

Storage (high I/O)

Dense storage

GPU compute

Graphics intensive

+

CAPABILITIES

Choice of processor
(AWS, Intel, AMD)

Fast processors
(up to 4.0 GHz)

High memory footprint
(up to 12 TiB)

Instance storage
(HDD, SSD, NVMe)

Accelerated computing
(GPUs and FPGA)

Networking
(up to 100 Gbps)

Bare metal

Size
(Nano to 32xlarge)

+

OPTIONS

Amazon EBS

Amazon Elastic Inference

=

MORE THAN

500+

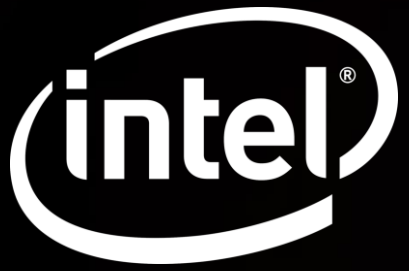
INSTANCE TYPES

for virtually every workload and business need

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AWS: Broad choice of processors



Intel Xeon Scalable processors



AMD EPYC processors



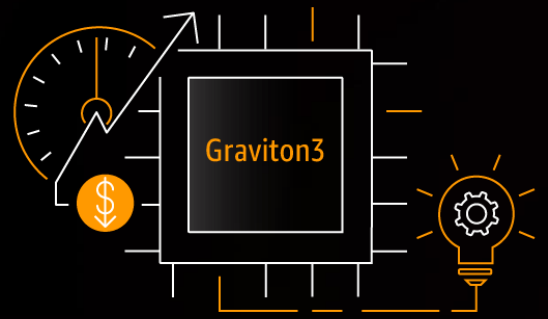
AWS Graviton processors

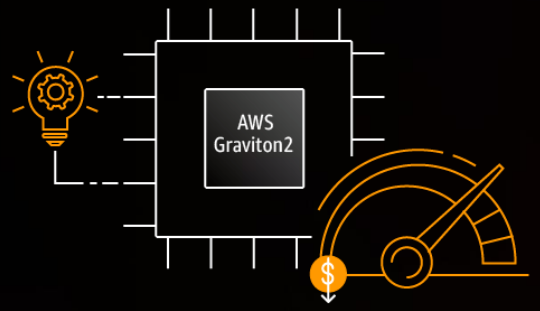
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AWS Graviton processors

NEW!





Custom AWS silicon with 64-bit Arm processor cores

Targeted optimizations for cloud-native workloads

Rapidly innovate, build, and iterate on behalf of customers

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Why AWS Graviton?



Up to 40% better price performance for scale-out workloads



Up to 20% less expensive* than x86-based compute



Improved sustainability – up to 60% more energy efficient than x86-based compute

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*Retail price for AWS Graviton2 instance families

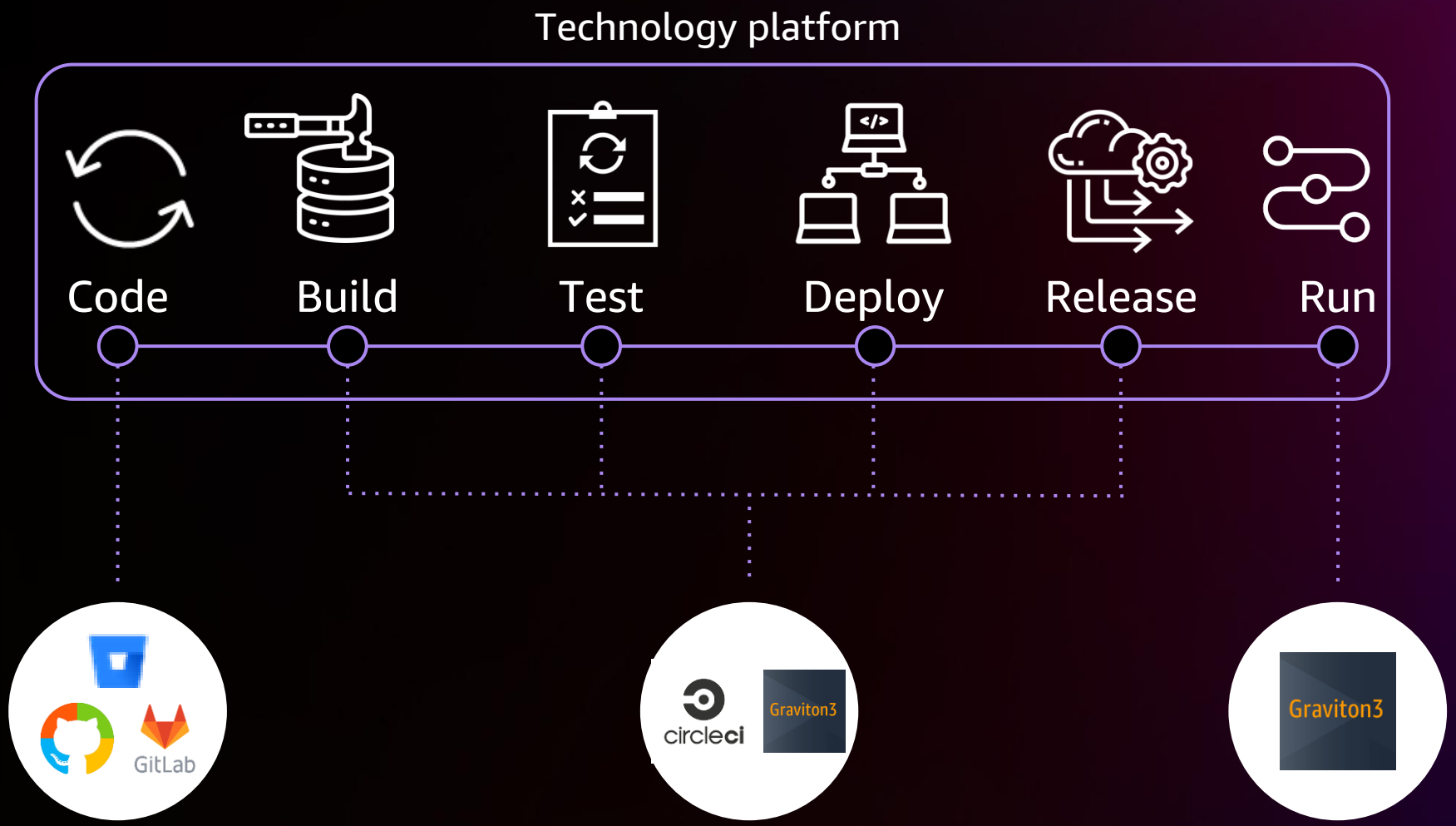
Ready to be a hero?

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Here’s how

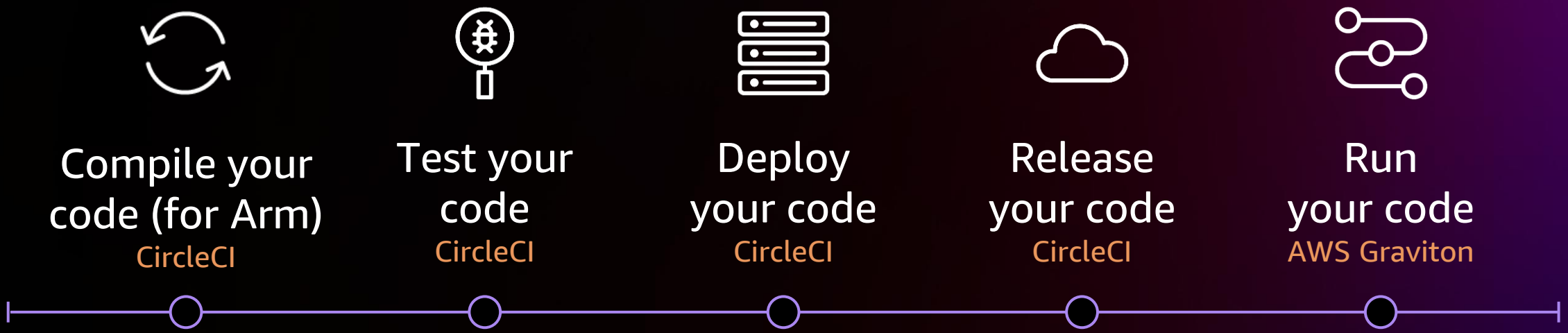
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Start with the right foundation



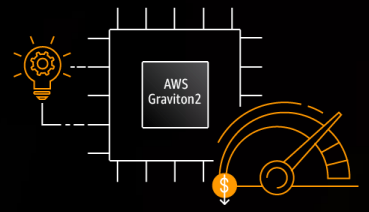
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Complete the steps to migrate



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AWS Graviton and CircleCI Arm compute collaboration



CircleCI launched as AWS Graviton-Ready Partner – one of the few services to offer cloud-based Arm CI/CD fleet

Massive scale

Superior scale for Arm developers

Price performance

40% better than x86

Powerful solution

AWS Graviton and CircleCI work to reduce barrier to entry for Arm compute

Cross-architecture

Validate code on both Arm & x86, which speeds Arm adoption

Only managed service

Quick to build/test/deploy fleet, fully managed by CircleCI on AWS

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Standard Linux config

```yaml
version: 2.1

jobs:
  build-medium:
    machine:
      image: ubuntu-2004:202107-02
    resource_class: medium
    steps:
      - run: uname -a
      - run: echo "Hello, Linux!"

  build-large:
    machine:
      image: ubuntu-2004:202107-02
    resource_class: large
    steps:
      - run: uname -a
      - run: echo "Hello, Linux!"

workflows:
  build:
    jobs:
      - build-medium
      - build-large
```

Arm config

```yaml
version: 2.1

jobs:
  build-medium:
    machine:
      image: ubuntu-2004:202101-01
    resource_class: arm.medium
    steps:
      - run: uname -a
      - run: echo "Hello, Linux!"

  build-large:
    machine:
      image: ubuntu-2004:202101-01
    resource_class: arm.large
    steps:
      - run: uname -a
      - run: echo "Hello, Linux!"

workflows:
  build:
    jobs:
      - build-medium
      - build-large
```

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CircleCI on AWS Graviton

- Arm-based instances in CI/CD pipelines
- Multiple CPUs across jobs
- Build behind the firewall
- Best performance per watt of energy use
- Build across virtually any number of parallel nodes
- Multi-architecture within a single pipeline

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The results

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Technical benefits

Streamlines migration

To migrate to Arm and Graviton, validate code on Arm instances at every development stage

Reduces costs

Use a variety of compute types within the same pipeline

Validate code for both Arm and x86-based environments

Startups & open-source projects

Scale fully managed workloads faster for a better price

Graviton instances for memory-intensive workloads on open-source projects

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How Honeycomb scaled using CircleCI and Graviton

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What is observability?

Observability allows you to inspect cause and effect at a granular level. It begins with **rich instrumentation**, putting you in constant conversation with your code.

Without observability, your team resorts to **guessing** and iterating **blindly**, without evidence, and you may struggle to connect **feedback loops**, which will make deploys challenging.

Observability = monitoring

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Why Honeycomb needs CircleCI

Speed is Important

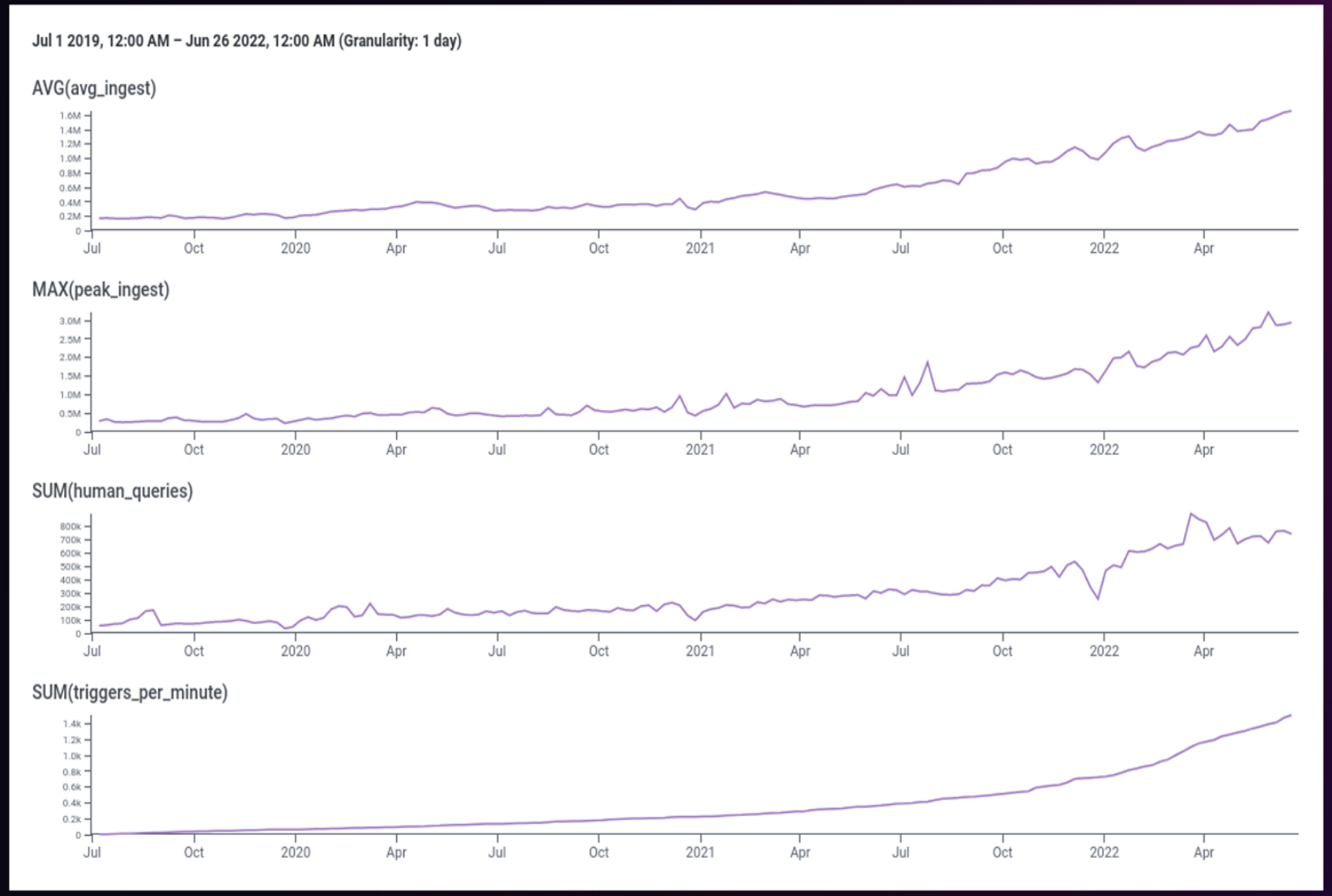
15-minute build or bust

More productive developers

We can trace builds with Honeycomb

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Why Honeycomb needs CircleCI



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Honeycomb's challenge

Stage 1
The challenge

Honeycomb needed to ship two different architectures quickly, with minimal internal resources

Stage 2
The solution

Moved from x86-based instances to AWS Graviton2

Selected CircleCI's Arm compute as their CI/CD service

Stage 3
How did we get there?

Single dogfood workload – comparison of x86 vs. Graviton2

Lower cost, more RAM, lower median and tail latency

One year to move 100% of workloads

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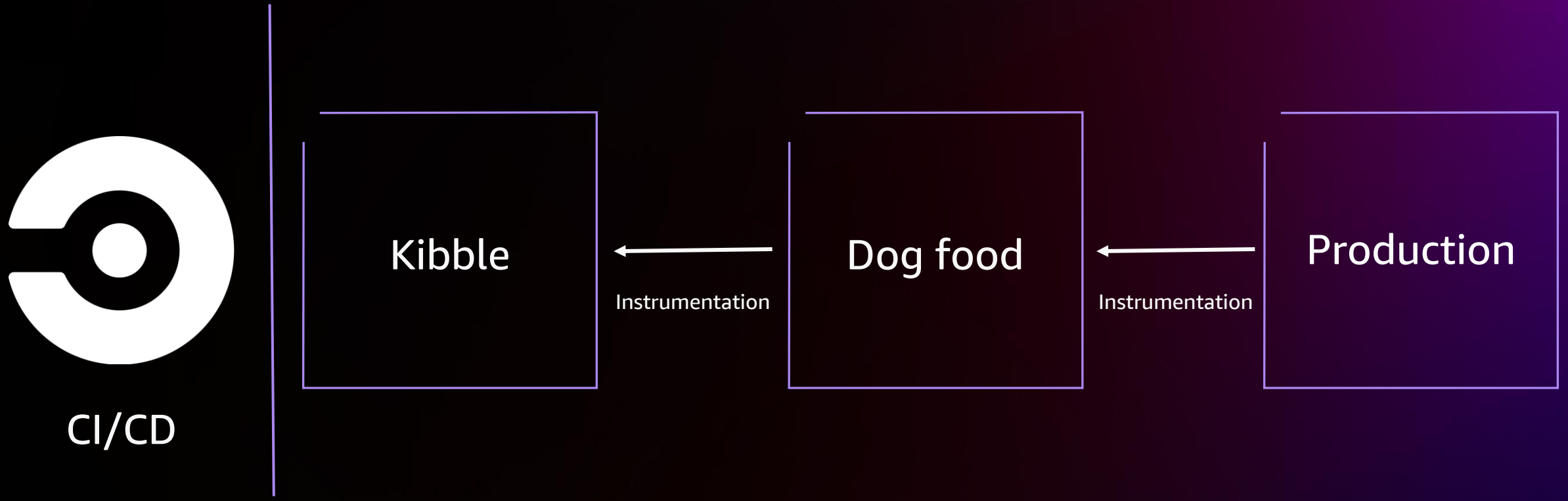
CircleCI’s Arm compute for CI/CD

CircleCI’s support for parallelism

Can now build multi-architecture Docker images natively and ship them to production at the same speed as binaries for single architecture

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Gaining confidence in production



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It started in CI

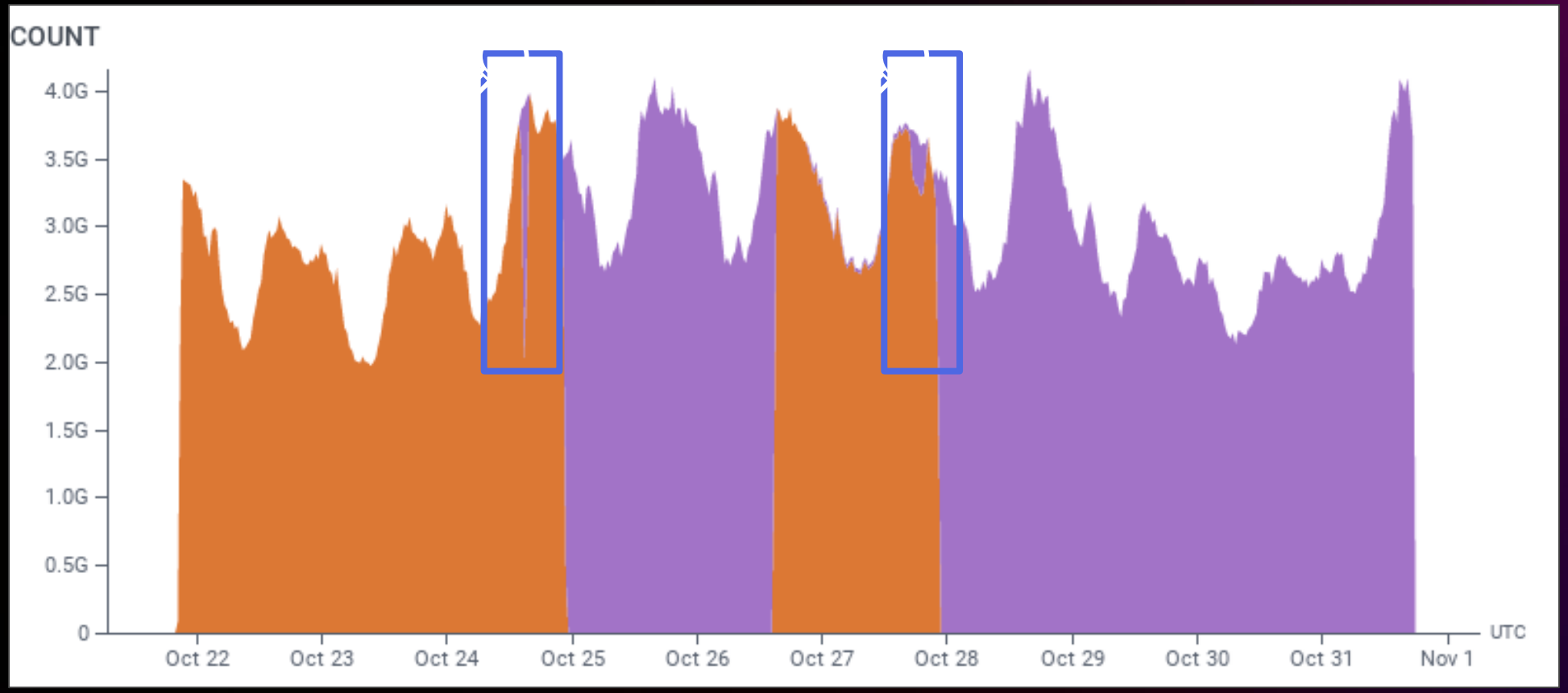
Multi-architecture builds
github.com/ko-build/ko

Carried over to external repos

```
jobs:
  build_agent:
    docker:
      - image: cimg/go:1.18
    # needed to build docker images, attach mount points, etc
    steps:
      - setup_remote_docker
      - checkout
      - run: go install github.com/ko-build/ko@latest
      - run: echo "VERSION=$(cat version.txt | tr -d '\n')" >> $BASH_ENV
      - run: ./build/build.sh
      - run: ./build/test.sh .
      - run: e2e-tests/test.sh
      - run:
          name: "Deploy on tagged master push"
          command: |
            if [ -z "${CIRCLE_PULL_REQUEST}" ] && [ -z "${CIRCLE_BRANCH}"
              echo "${DOCKER_PASSWORD}" | docker login -u "${DOCKER_USERNA
              KO_DOCKER_REPO=honeycombio ./build/build.sh
            else
              echo "skipping push. CIRCLE_PULL_REQUEST=${CIRCLE_PULL_REQU
            fi;
```

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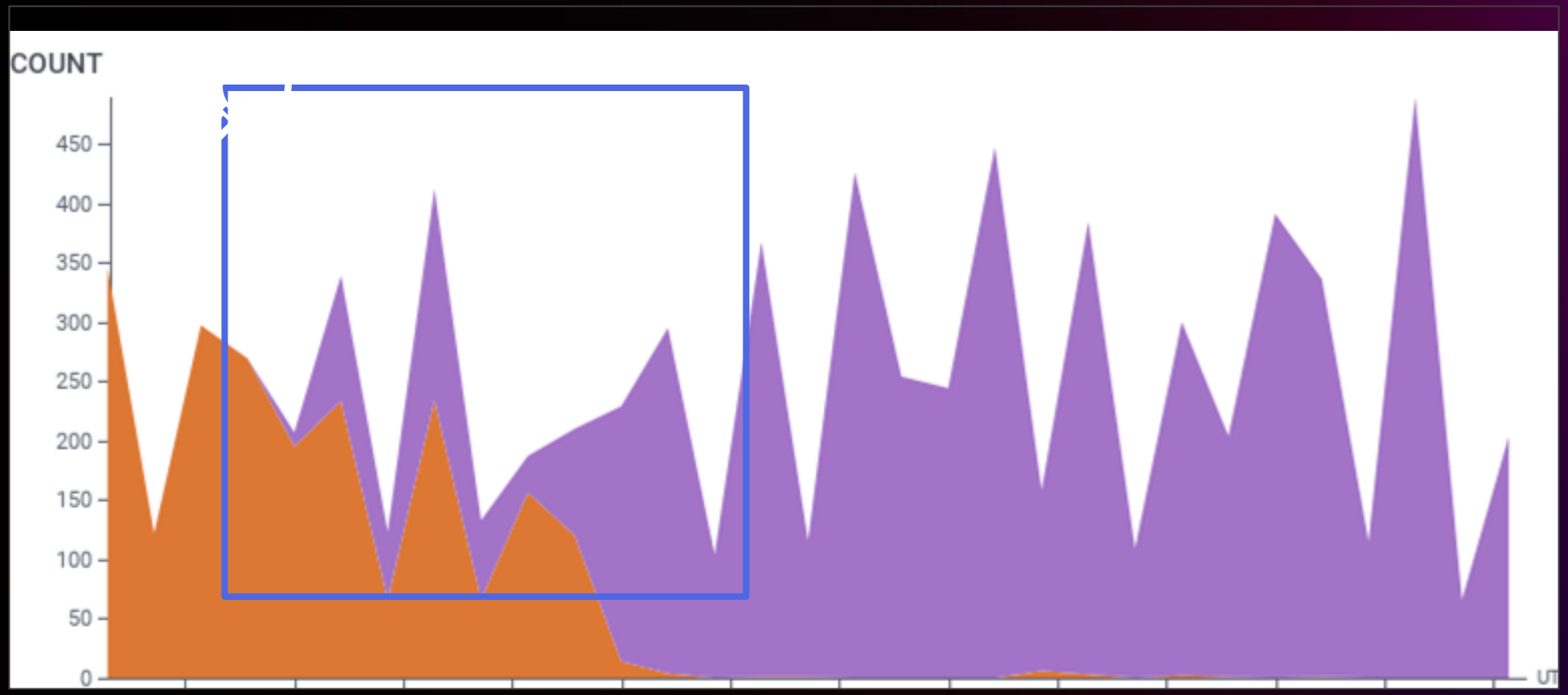
New ingest path case



Turned on new Shepherd path for a percent of traffic :point_up:

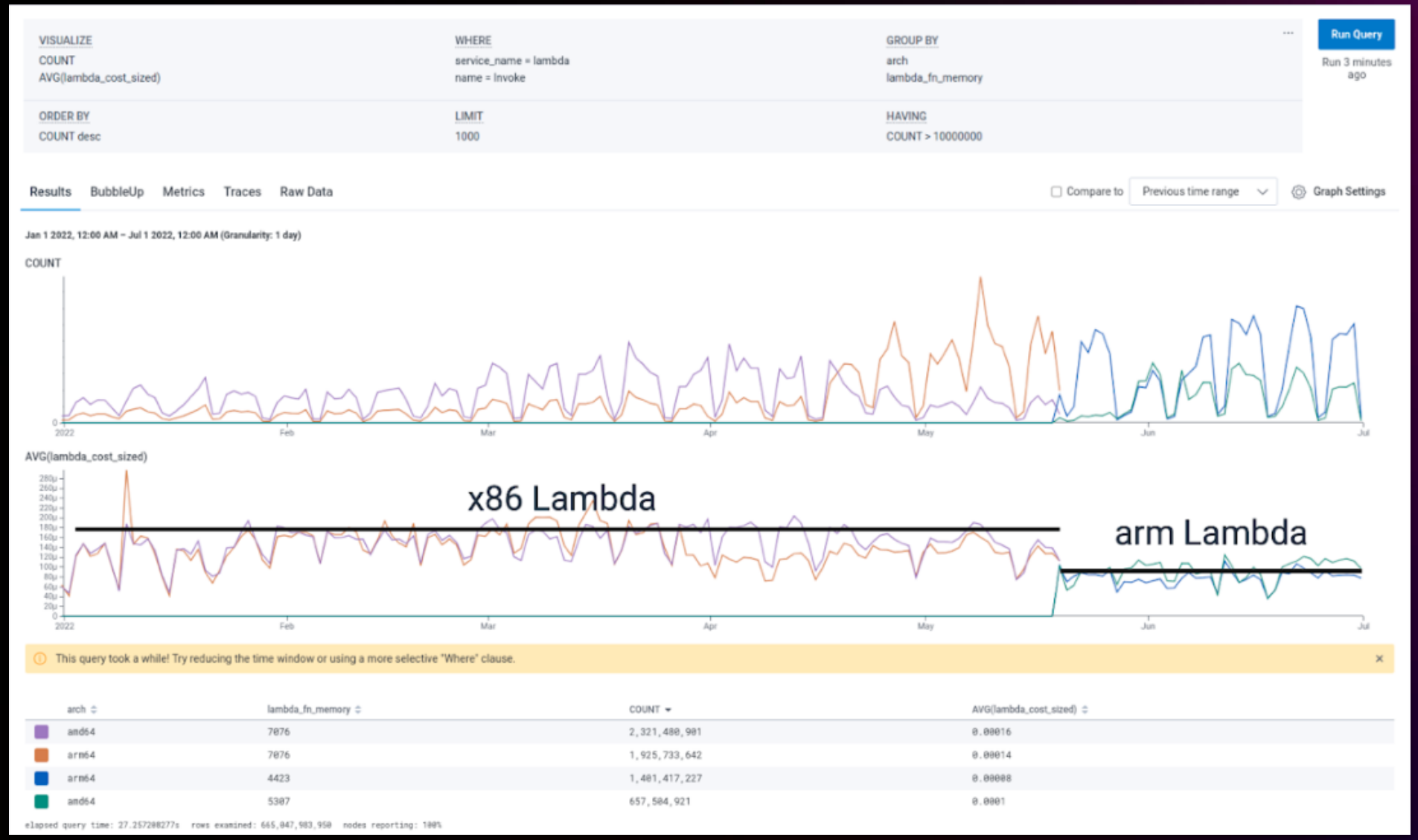
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New UI case



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AWS Lambda on AWS Graviton lowers TCO



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Speed



10% reduction in median latency for Retriever function

Reduced build and test cycle time average from 20–30 minutes to 10 minutes

Native multi-architecture Docker images

Ship at the speed of binaries for single architecture

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Scale

Scaled 10x over 3 years with no increase to engineering staff – same resources more power

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Cost savings 

Cut compute costs by 50%

Improved build and test speeds by 50%

–60% emissions

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Precision gives confidence.

Analyze and compare all customer experiences, good and bad

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Want to learn more?

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CircleCI and AWS

CircleCI helps you in your process of developing applications and deploying them to AWS

Start building for free



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Questions?

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Thank you!



Please complete the session survey in the **mobile app**

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