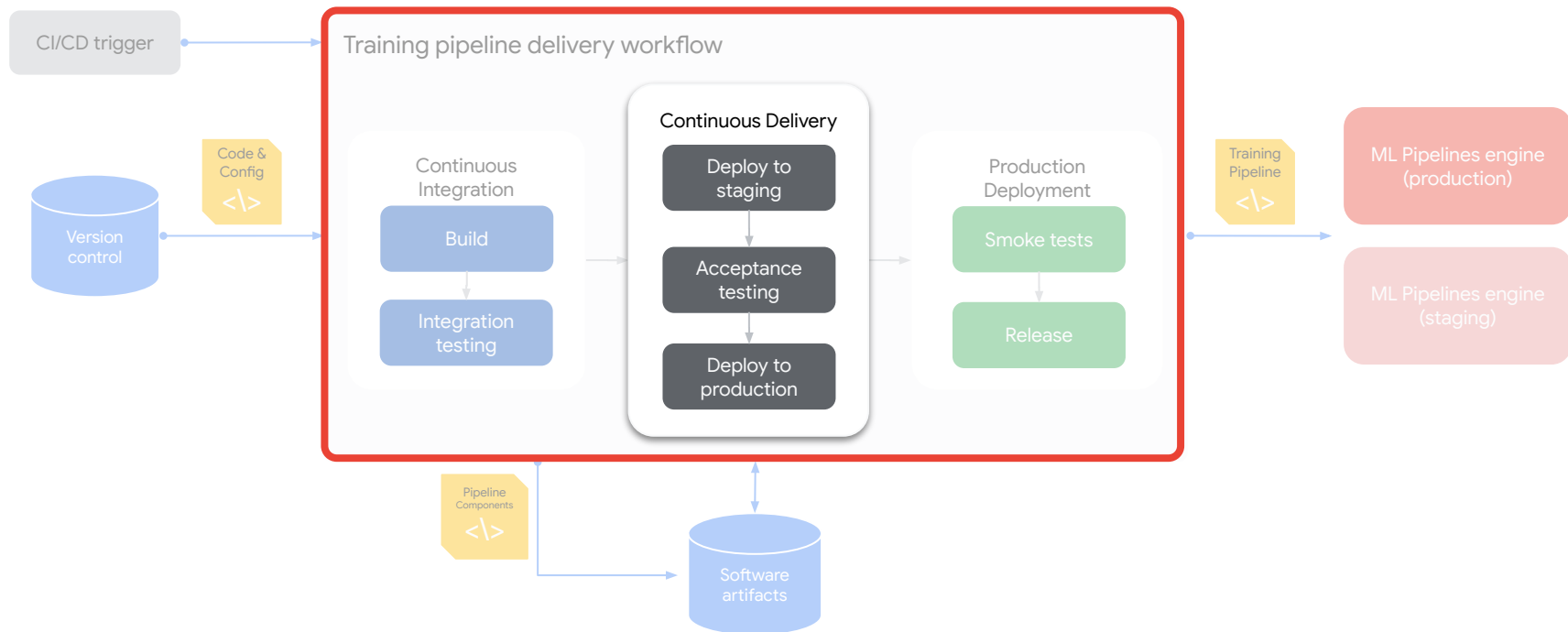


Continuous Delivery



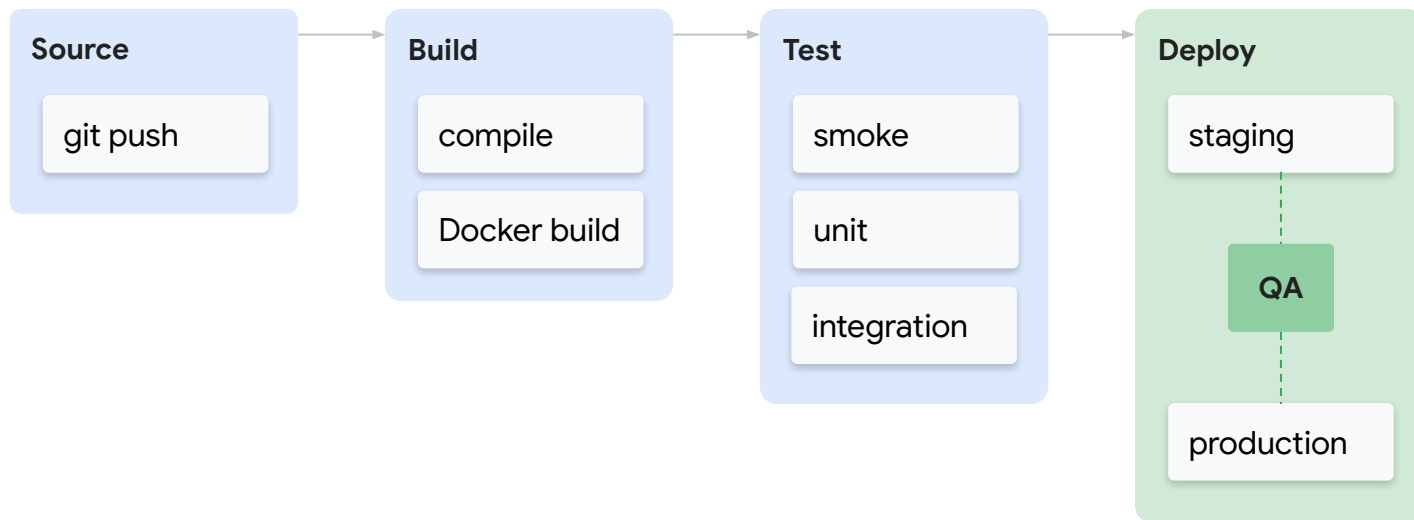
MLOps: Training Operationalisation

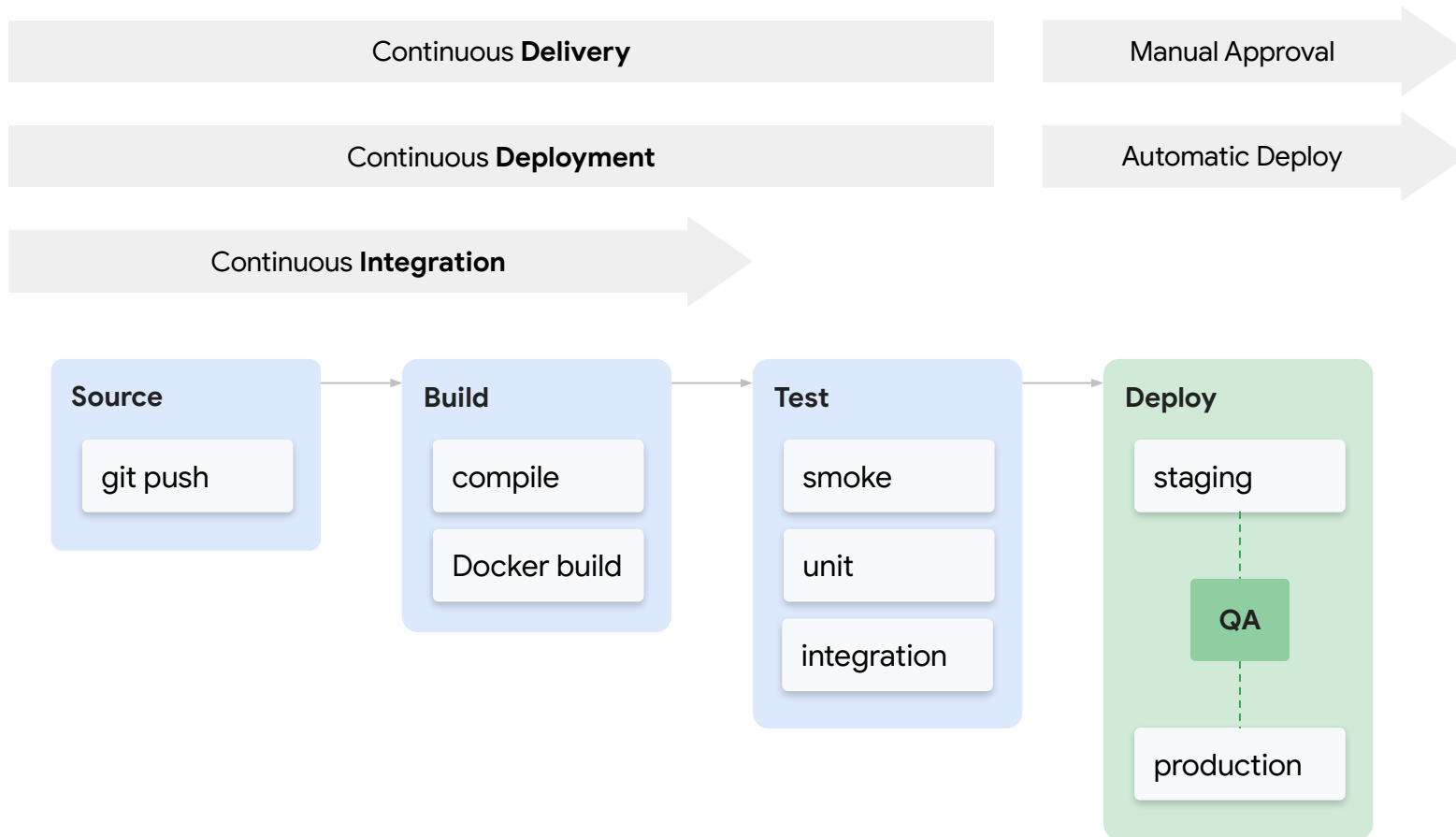


Continuous **Delivery**

Continuous **Deployment**

Continuous **Integration**





ML Commons

mlcommons.org/en/

ML Commons

Machine learning innovation to benefit everyone.

What's New

12.14.202112.14.2021

Close

About

News

Leadership

Philosophy

History

Policies

Credits

Benchmarks

Training

Training: HPC

Inference:

Datacenter

Inference: Edge

Inference: Mobile

Inference: Tiny

Datasets

Multilingual Spoken Words

People's Speech

Best Practices

MLCube

Working Groups

Get Involved

Getting Started

Attend Events

Become a Member

Become an Affiliate

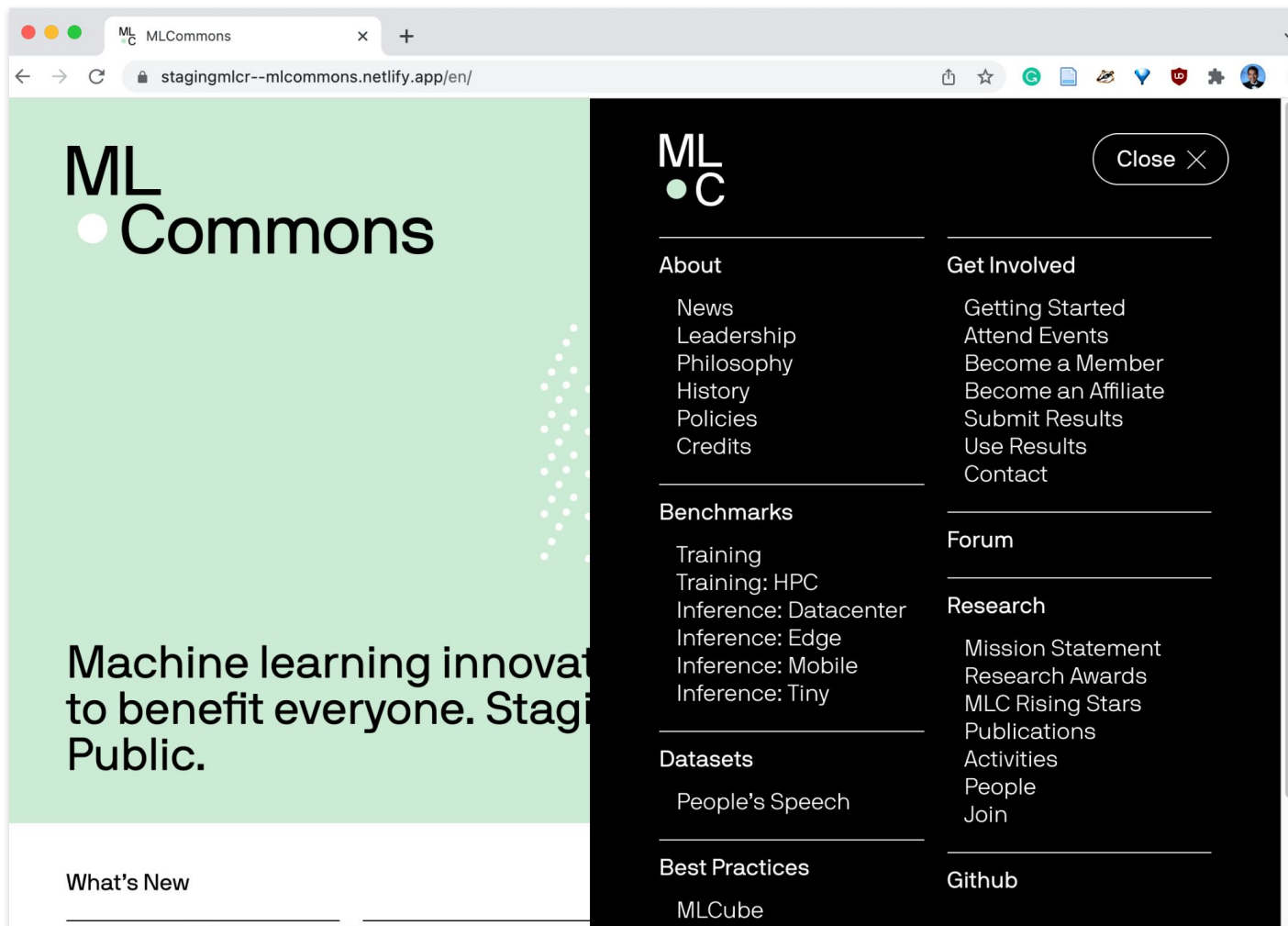
Submit Results

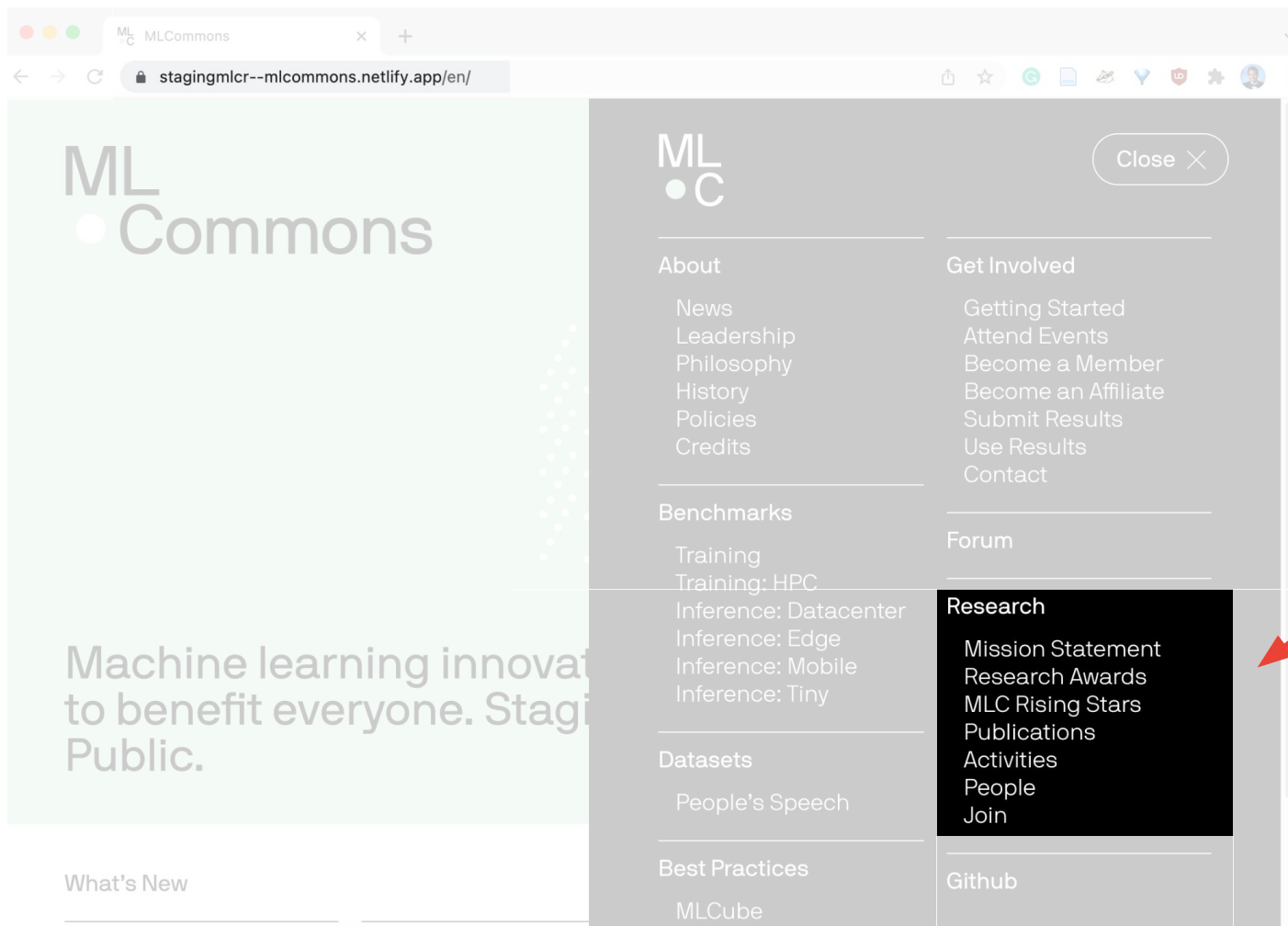
Use Results

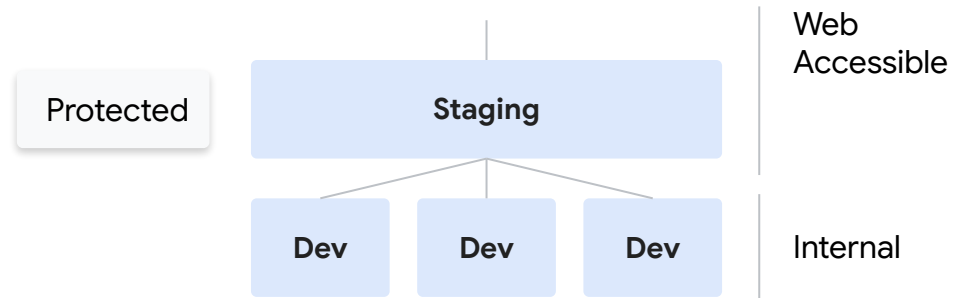
Contact

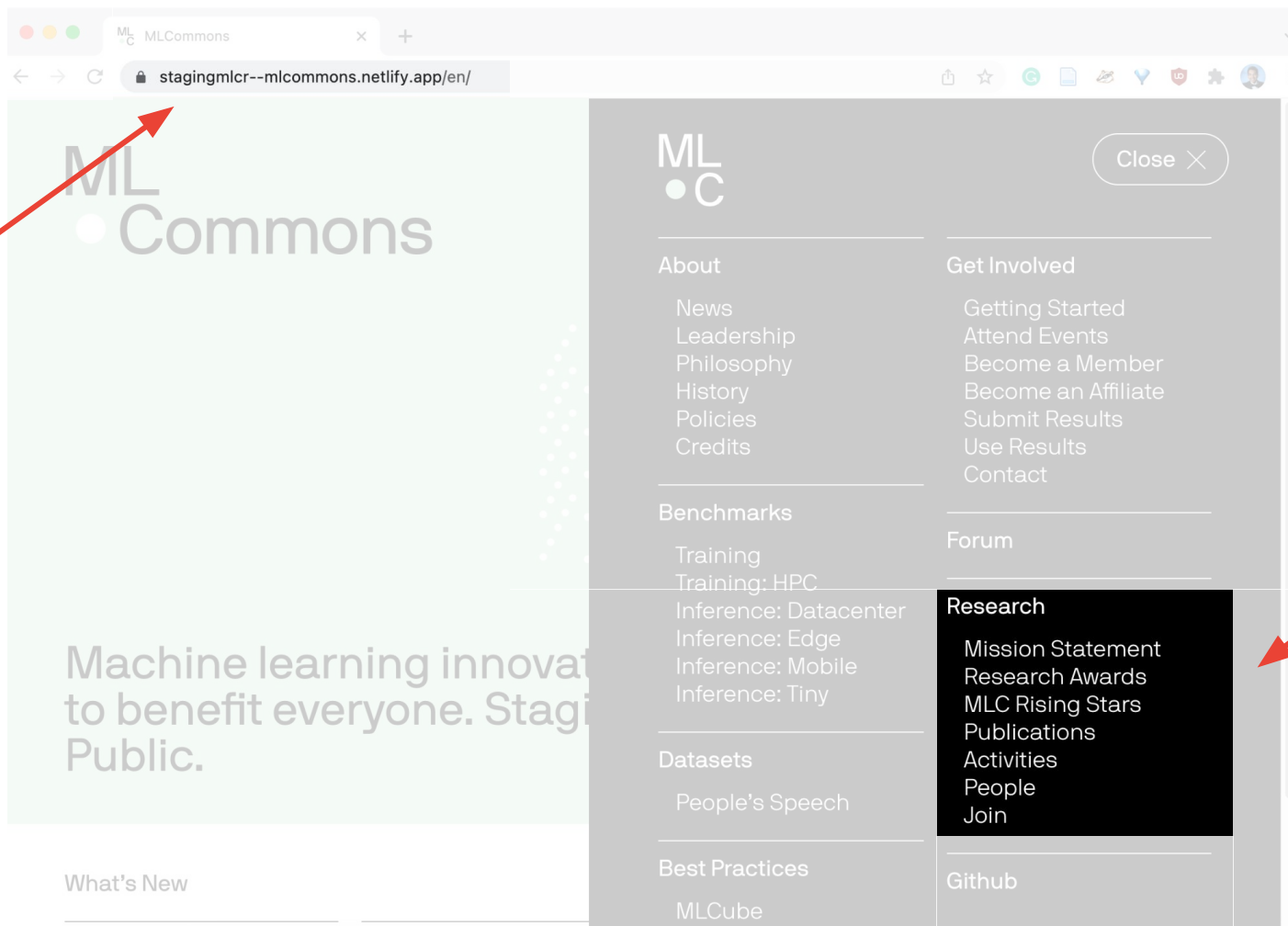
Forum

Github










ML Commons

stagingmlcr--mlcommons.netlify.app/en/

Dimensions: Pixel 2 411 x 731 87% Mobile

Menu

ML Commons



Machine learning innovation to benefit everyone. Staging Public.

What's New

06.30.2021

MLCommons™ Releases MLPerf™ Training v1.0 Results

The latest benchmark submission round includes over 650 ML Training performance results for leading ML

06.16.2021

MLCommons™ Releases MLPerf™ Tiny Inference Benchmark

The new MLPerf Tiny v0.5 benchmark suite releases first performance results, measuring neural

Elements

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
  <head>...</head>
  <body data-new-gr-c-s-check-loaded="14.1043.0" data-gr-ext-installed> flex
    <header class="header grid-wrapper page-pad">...</header> flex
    <main class="tmpl-home">
      ...
      <div class="home-hero page-pad col-12">...</div> flex == $0
      <div class="recent-news page-pad">...</div>
      <div class="home-text page-pad">...</div>
      <div class="brand-pillars grid-wrapper">...</div> flex
      <div class="home-features grid-wrapper page-pad">...</div> flex
      <div class="member-list page-pad">...</div>
    </main>
    <footer class="footer grid-wrapper page-pad text-xs">...</footer> flex
  <script src="/scripts/index.is"></script>
</body>
html body main.tmpl-home div.home-hero.page-pad.col-12
```

Styles

Filter

```
element.style {
}

.home-hero {
  background-color: #eeced4;
  background-color: var(--brand-color-1);
  padding-bottom: 2rem;
  display: flex;
  flex-direction: column;
}

.col-12 {
  width: 100%;
}

.brand-pillars, .global-nav, .page-pad {
  padding-left: 0.5rem;
  padding-right: 0.5rem;
}

* {
```

index.css:1

index.css:1

index.css:1

index.css:1

Console

Filter

Default levels 1 issue: 1

>

The screenshot shows a web browser window with the URL `stagingmlcr--mlcommons.netlify.app/en/`. The page displays the MLCommons logo, a navigation menu, and a hero section with the text "Machine learning innovation to benefit everyone. Staging Public." Below this, there are two columns of news items under the heading "What's New". A red arrow points to the MLCommons logo. The Chrome DevTools Elements panel is open on the right, showing the HTML structure of the page. The selected element is `div.home-hero.page-pad.col-12`, and its styles are listed below. The console panel is also open at the bottom, showing no issues.

Dimensions: Pixel 2 411 x 731 87% Mobile

ML Commons Menu

Machine learning innovation to benefit everyone. Staging Public.

What's New

06.30.2021 MLCommons™ Releases MLPerf™ Training v1.0 Results
The latest benchmark submission round includes over 650 ML Training performance results for leading AI

06.16.2021 MLCommons™ Releases MLPerf™ Tiny Inference Benchmark
The new MLPerf Tiny v0.5 benchmark suite releases first performance results, representing a

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
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  <body data-new-gr-c-s-check-loaded="14.1043.0" data-gr-ext-installed>
    <header class="header grid-wrapper page-pad">_</header>
    <main class="tmpl-home">
      <div class="home-hero page-pad col-12">_</div>
      <div class="recent-news page-pad">_</div>
      <div class="home-text page-pad">_</div>
      <div class="brand-pillars grid-wrapper">_</div>
      <div class="home-features grid-wrapper page-pad">_</div>
      <div class="member-list page-pad">_</div>
    </main>
    <footer class="footer grid-wrapper page-pad text-xs">_</footer>
  </body>
</html>
```

html body main.tmpl-home div.home-hero.page-pad.col-12

Styles Computed Layout Event Listeners DOM Breakpoints Properties

Filter :hov .cls +

```
element.style {
}

.home-hero {
  background-color: #eeced4;
  background-color: var(--brand-color-1);
  padding-bottom: 2rem;
  display: flex;
  flex-direction: column;
}

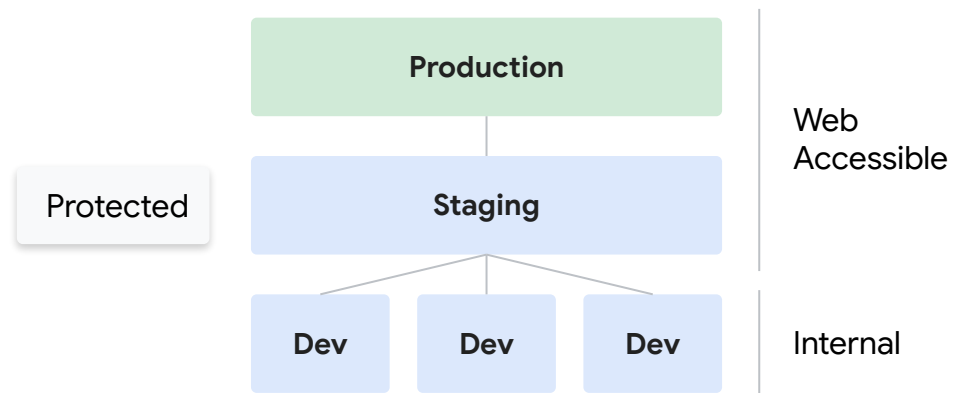
.col-12 {
  width: 100%;
}

.brand-pillars, .global-nav, .page-pad {
  padding-left: 0.5rem;
  padding-right: 0.5rem;
}

* {
}
```

Console

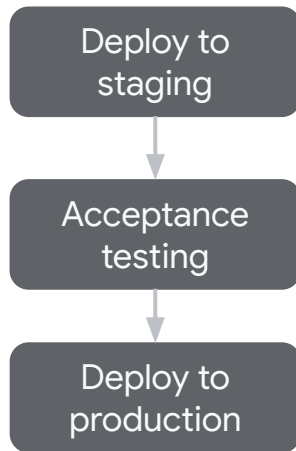
top Filter Default levels 1 issue



TinyML CD Questions

- What does the **staging environment** look like?
- What is considered as **accepted testing**?
- What and **how do I deploy** into production?

Continuous Delivery

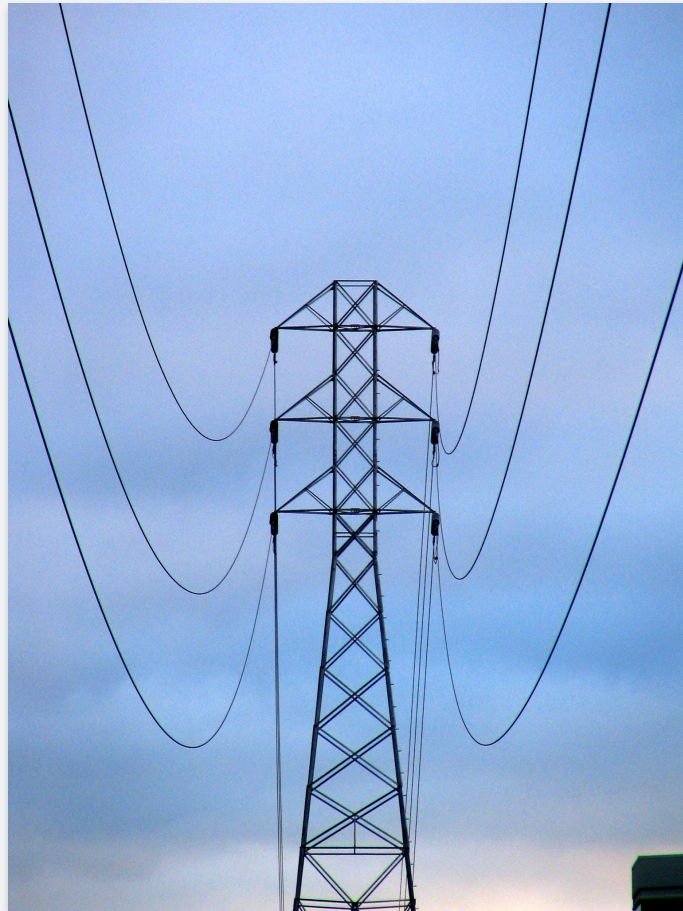




Case Study

Smart Powerline Monitoring System

- A simple infrastructure failure can quickly escalate into catastrophic consequences
- Use a **TinyML** device to preemptively predict and prevent outages and failovers



RAM-1 Smart Device for Electric Grids

- Built-in **predictive maintenance** features



RAM-1 Smart Device for Electric Grids

- Built-in **predictive maintenance** features
- Can do energy **conservation** via voltage reduction



RAM-1 Smart Device for Electric Grids

- Built-in **predictive maintenance** features
- Can do energy **conservation** via voltage reduction
- **Integrated** into an electric grid
- Improves **reliability** and decreases the risk of blackouts and brownouts
- Quickly **respond** to overloaded circuits **with corrections**





Continuous Delivery

**Deploy to
staging**

Acceptance
testing

Deploy to
production



Continuous Delivery

Deploy to
staging



**Acceptance
testing**



Deploy to
production



Continuous Delivery

Deploy to
staging



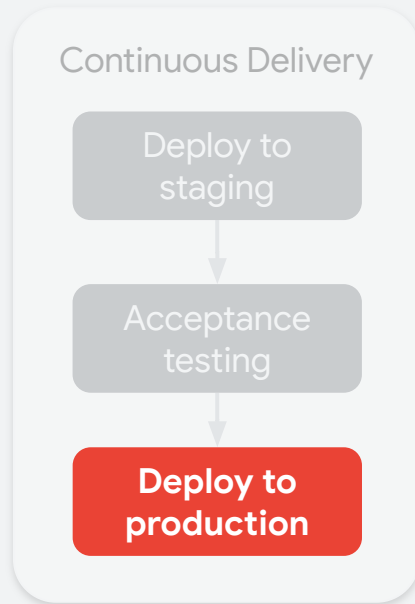
**Acceptance
testing**



Deploy to
production

Deployment to Production

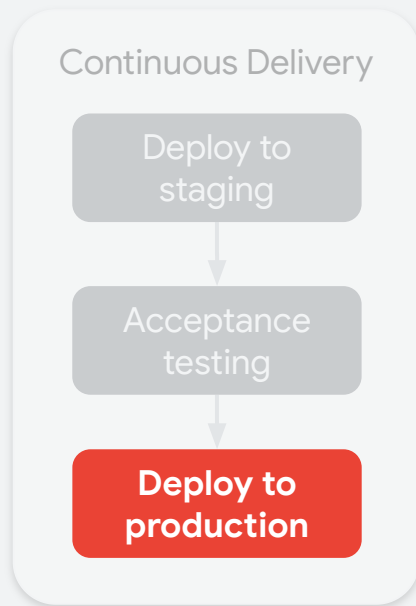
- Deploy the device **physically**
 - Install the device at the location



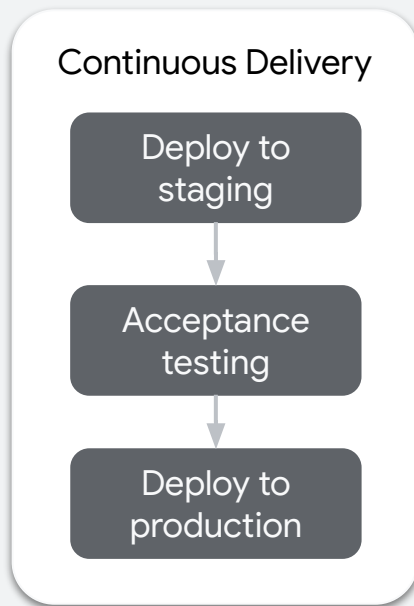


Deployment to Production

- Deploy the device **physically**
 - Install the device at the location
- Deploy over-the-air (**OTA**)
 - Already deployed in field, but needs an OTA update



Continuous delivery lets your team *automatically* build, test, and prepare code changes for release to production so that your software delivery **fast** and **efficient**.





Continuous Delivery

Deploy to
staging



Acceptance
testing



Deploy to
production