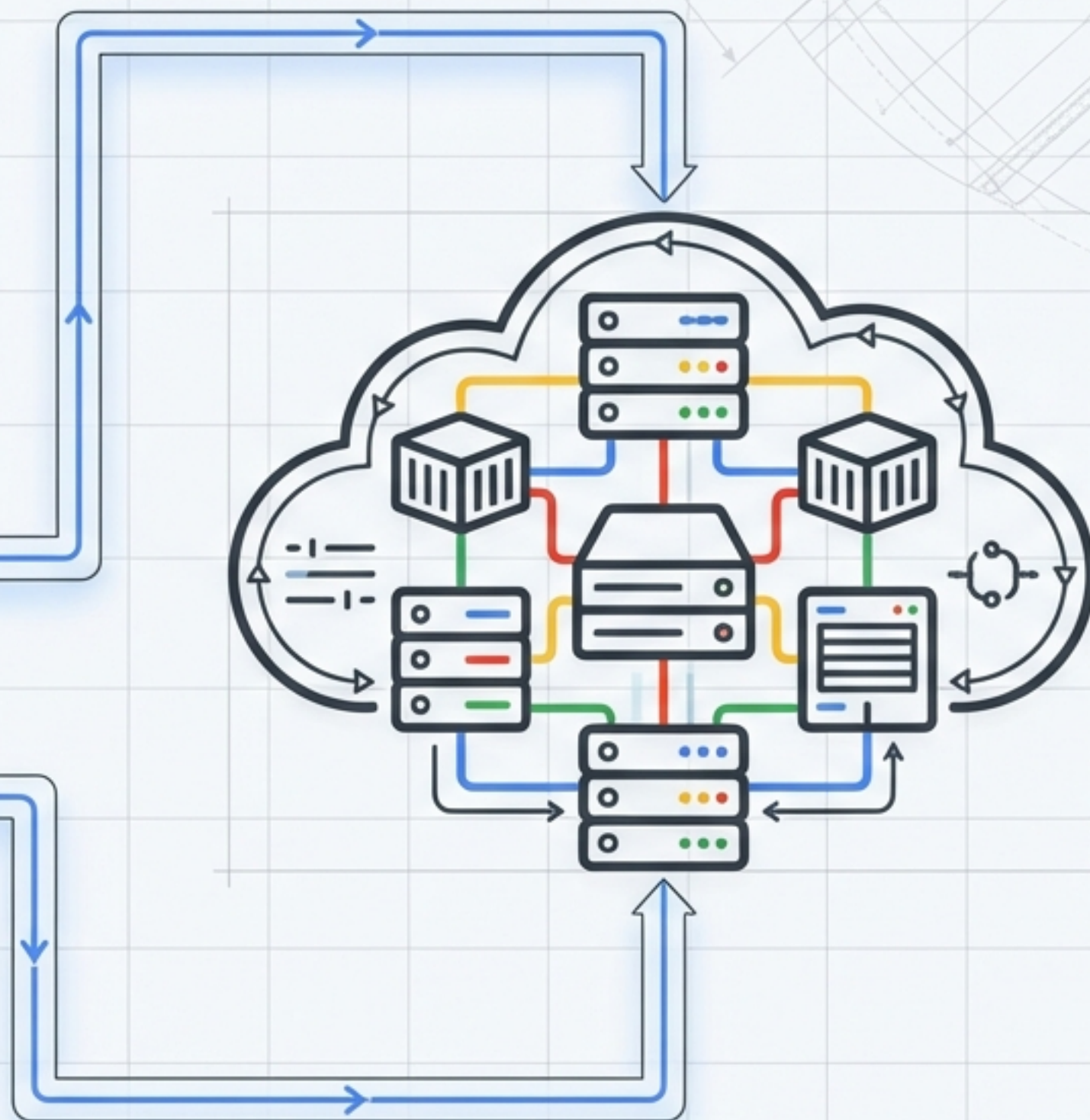


Google Cloud Professional Cloud Developer Prep

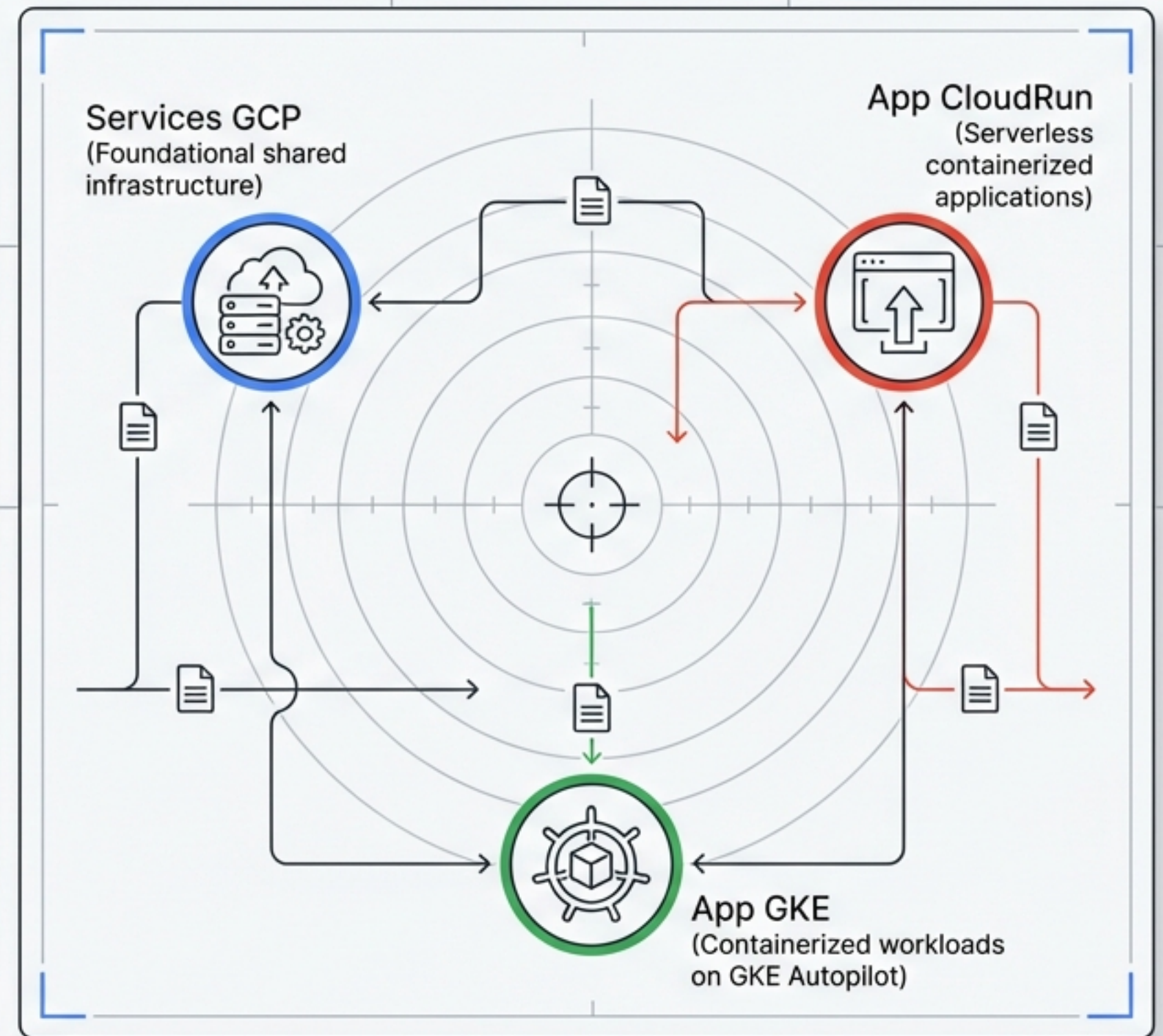
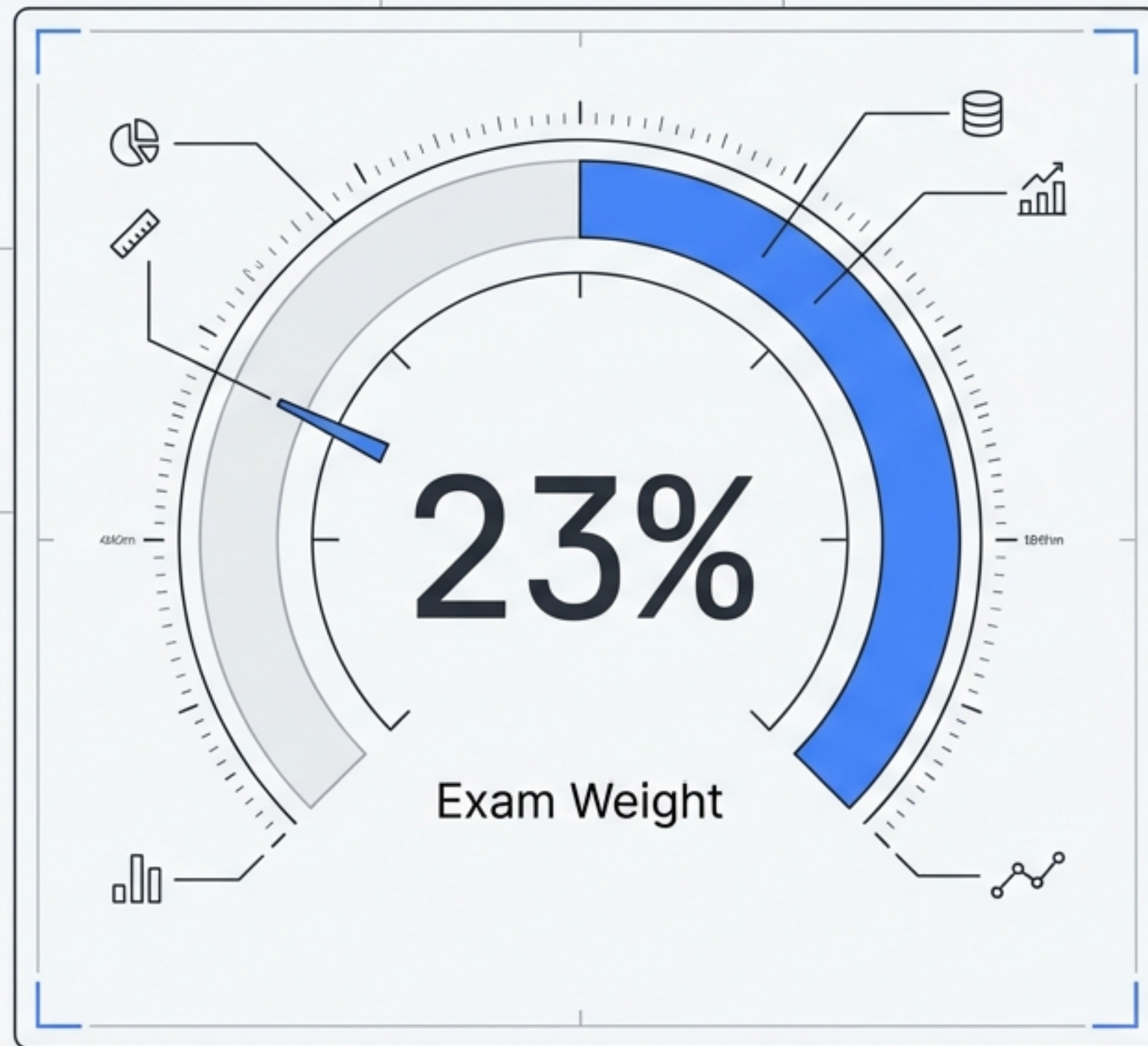
Mastering PCD Section 2: Building & Testing Applications

The definitive visual guide to Google Cloud developer tools, CI/CD pipelines, and secure deployments.



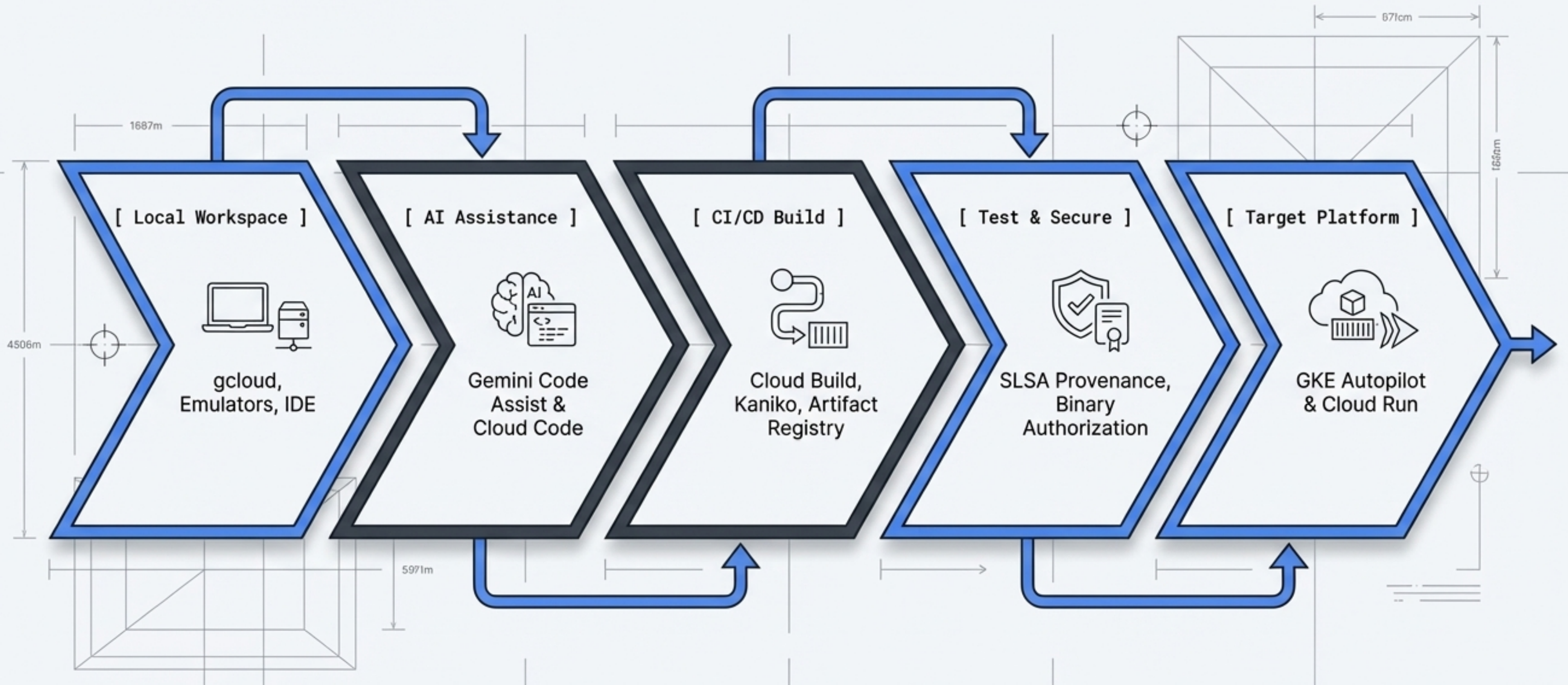
Mission Parameters: PCD Section 2

Master the journey from local development to secure, automated cloud deployment.

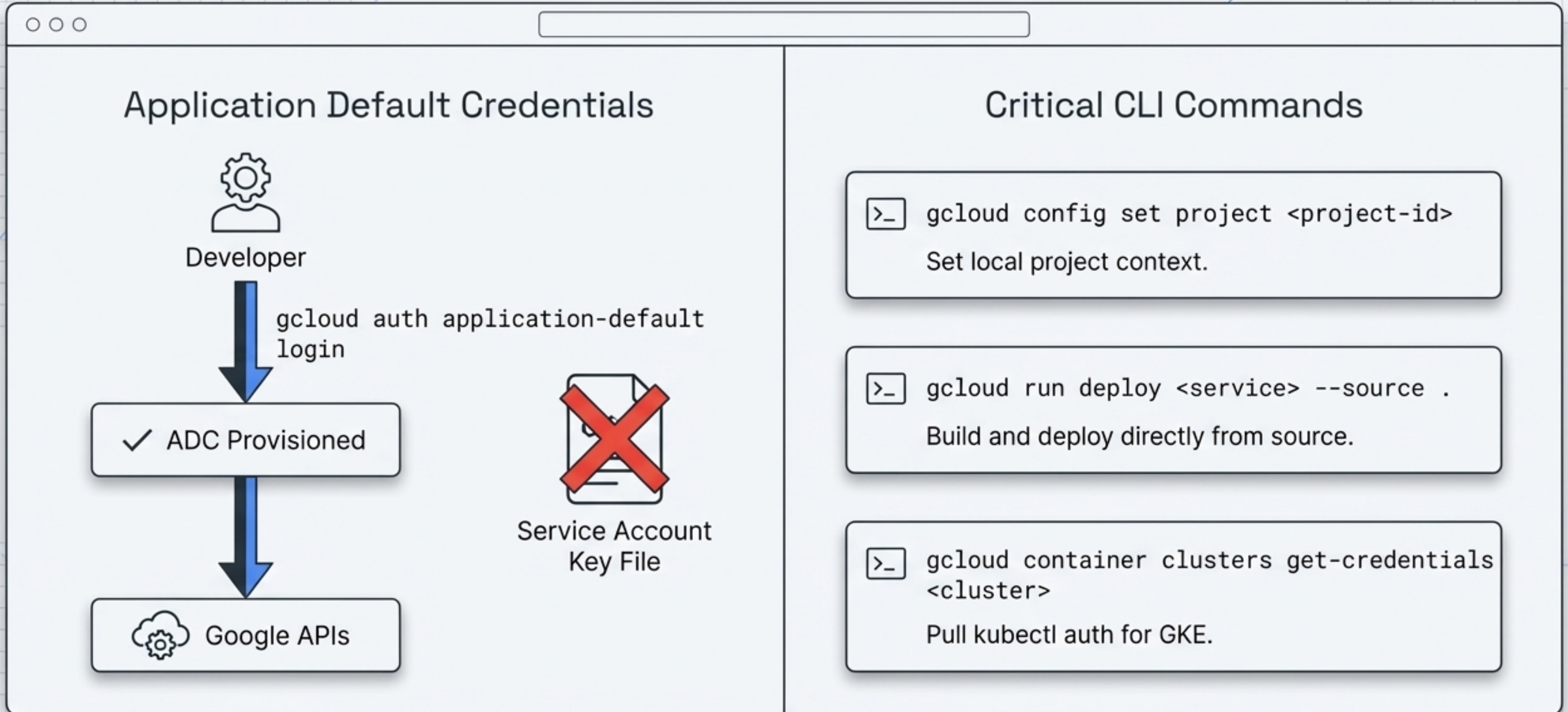


The Developer's Journey

The certification doesn't just test isolated tools; it tests your ability to wire them together into a continuous, secure software supply chain.

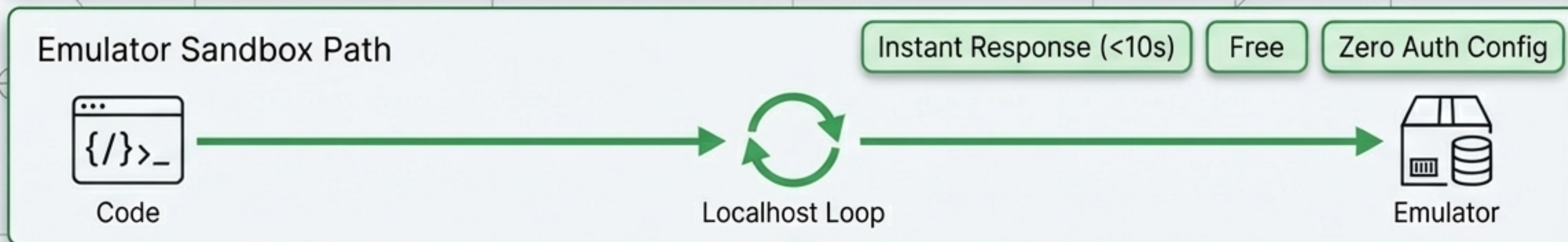
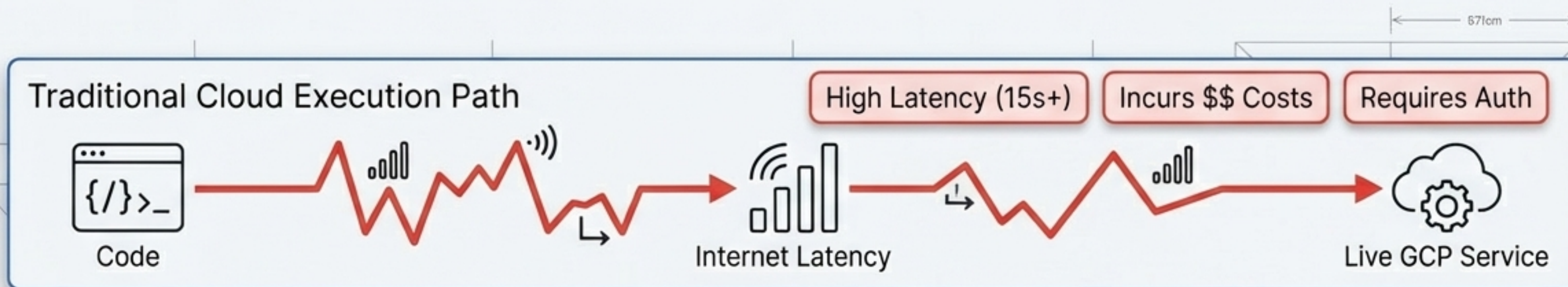


Foundational Setup: Auth & The CLI

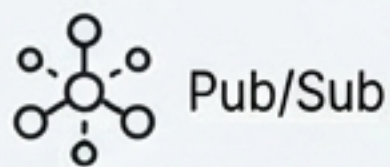


The Emulator Sandbox: Bypassing the Cloud Toll Booth

Accelerate development and reduce costs with local service emulation.



Supported Emulators: `gcloud beta emulators [service] start`



Pub/Sub



Datastore



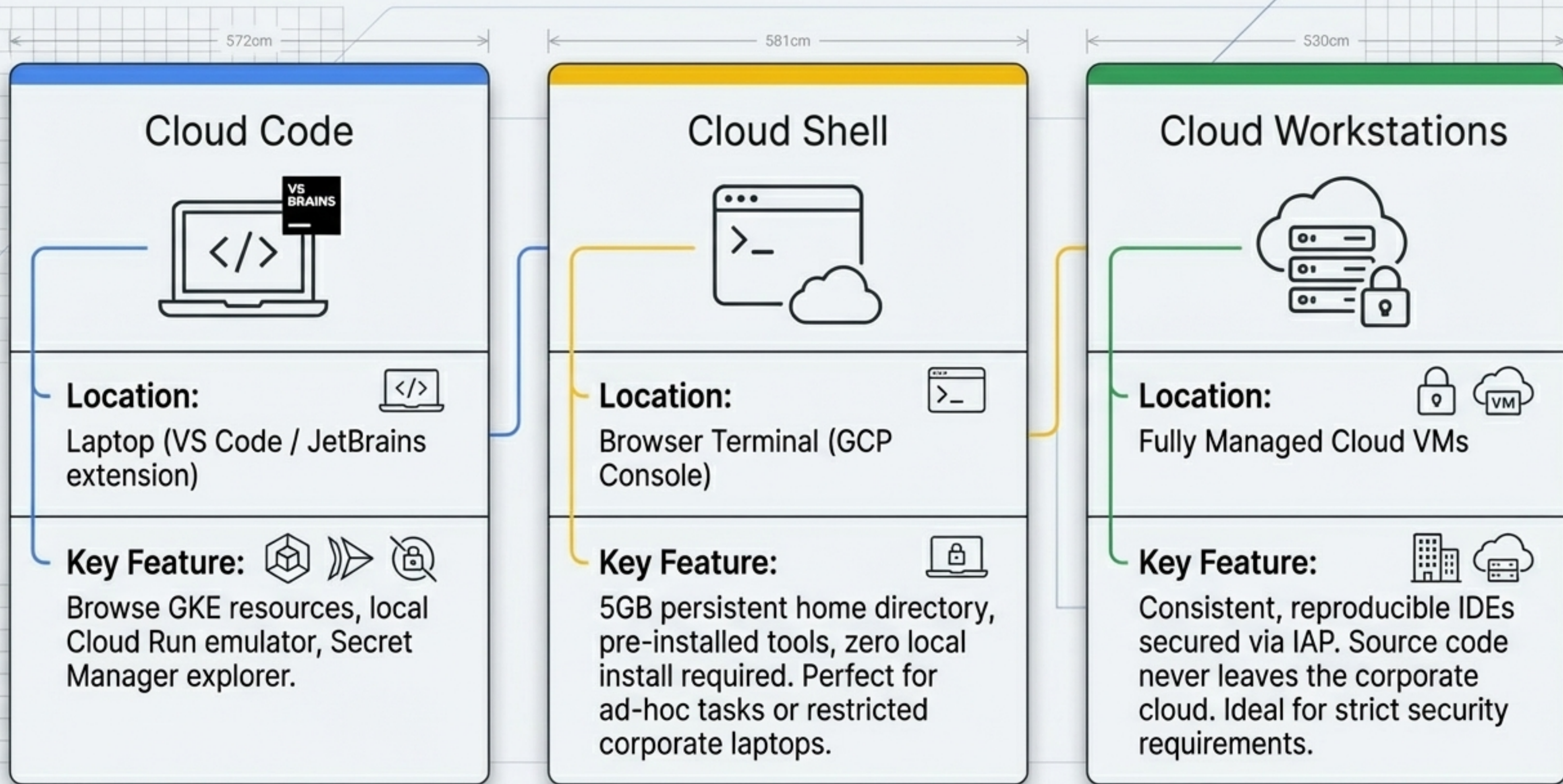
Spanner



Bigtable

Real-World Impact: Run pytest locally against emulated Pub/Sub and Firestore. Tests execute 15x faster than live cloud integrations.


The Workspace Spectrum



Differentiating the Gemini Twins

572cm

Gemini Code Assist



The Developer

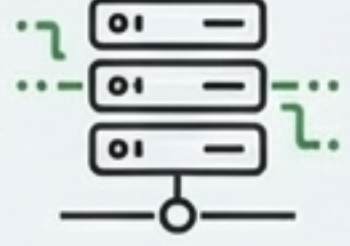
Location:
Inside the IDE (via Cloud Code) or idx.google.com

Superpowers:
Context-aware inline completion, generating unit tests, code explanation.

Example Prompt:
Write a Python function to read the 10 most recent rows from Bigtable using a specific row key format.

530cm

Gemini Cloud Assist



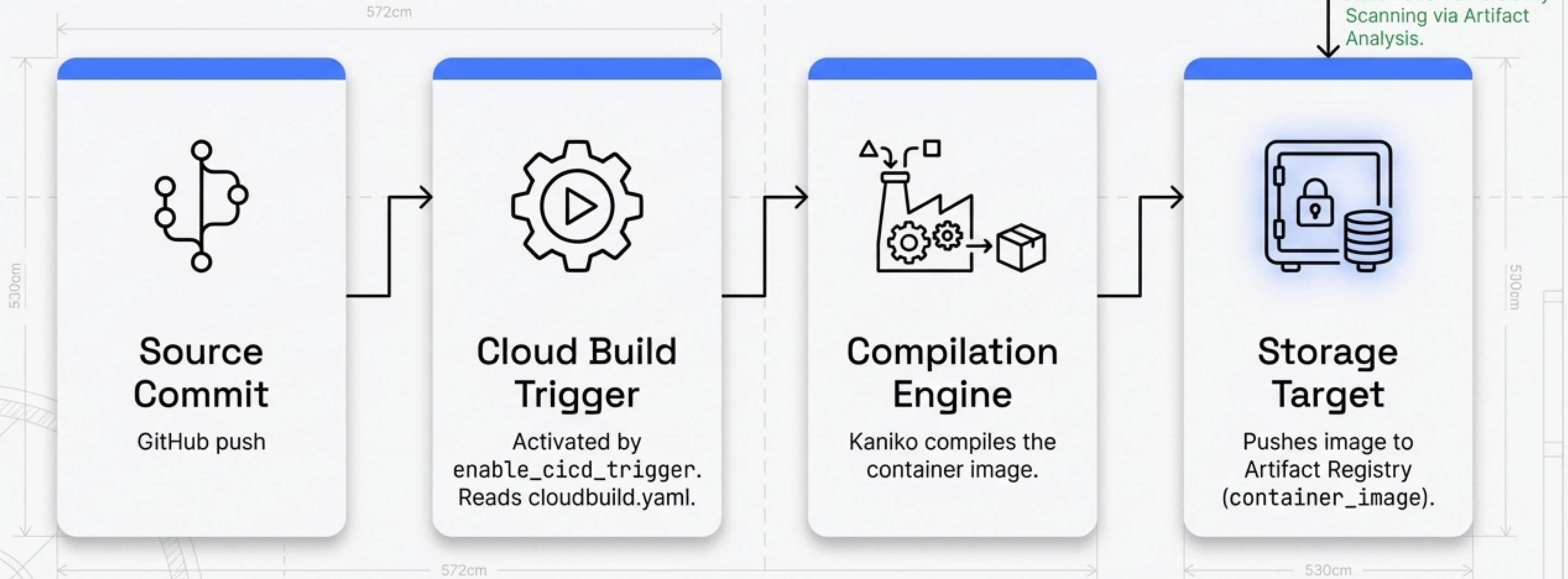
The Operator

Location:
The GCP Console (Sparkle icon in top nav)

Superpowers:
Writing MQL (Monitoring Query Language), analyzing logs, infrastructure querying.

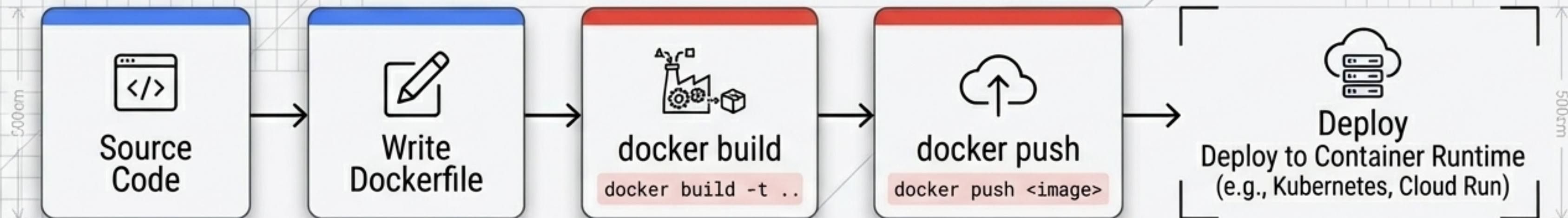
Example Prompt:
Which Cloud Run services have the highest latency this week?

The Build Architecture (CI/CD Flow)



Source-Based Deployment: Bypassing Dockerfiles

Traditional Container Build

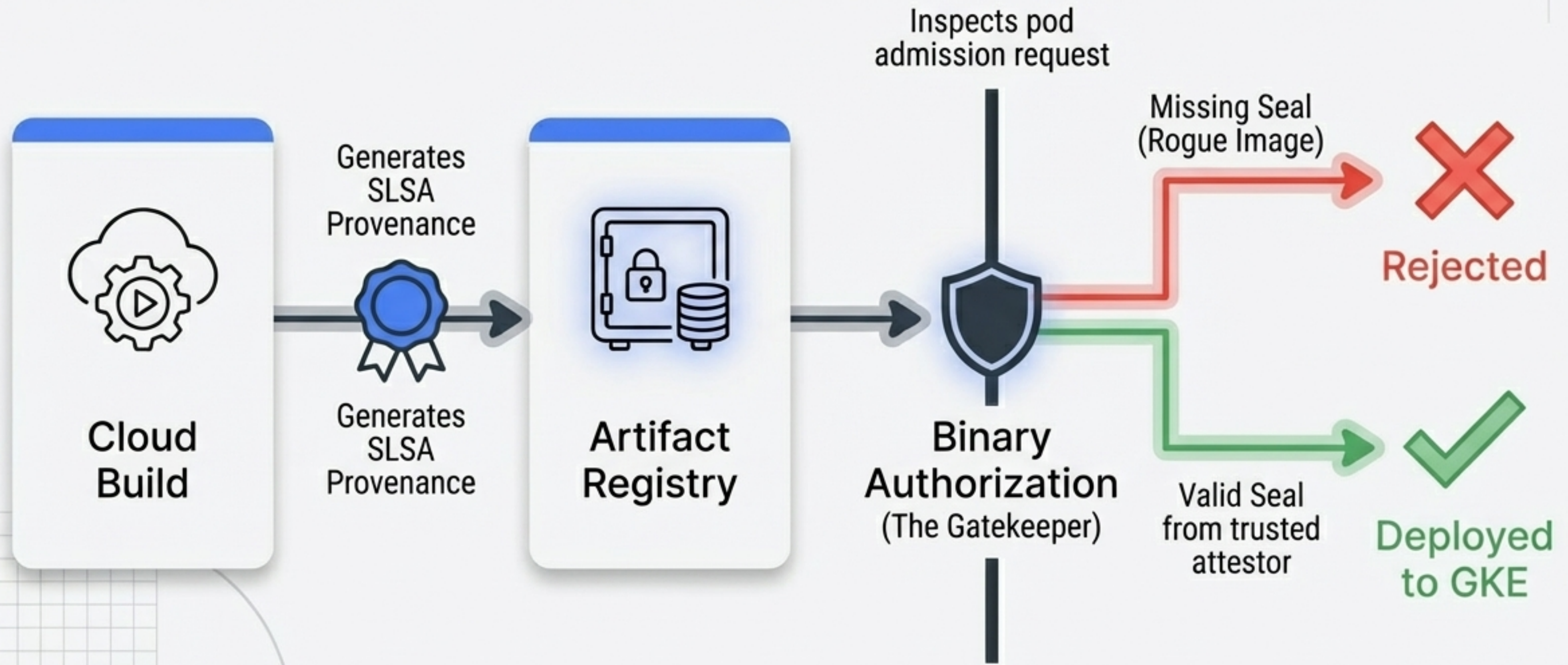


Buildpacks



i Takeaway: Buildpacks allow rapid prototyping and deployment without writing or maintaining container configurations.

The Gatekeeper: Secure Supply Chain



Automated Testing in CI



Core Rule: A non-zero exit code on any test step halts the entire pipeline. The broken image never reaches Artifact Registry or Cloud Deploy.

Advanced Testing Strategies

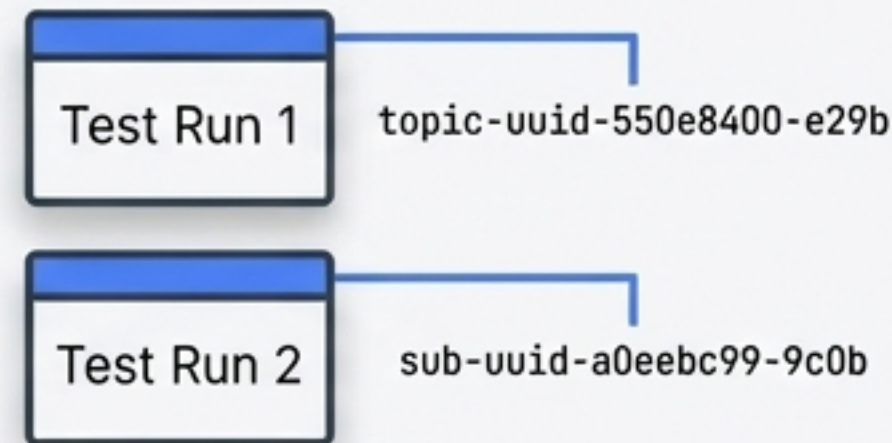


AI-Powered Unit Tests

```
def process_data(data):  
    if not data: raise ValueError  
    return clean_data(data)
```

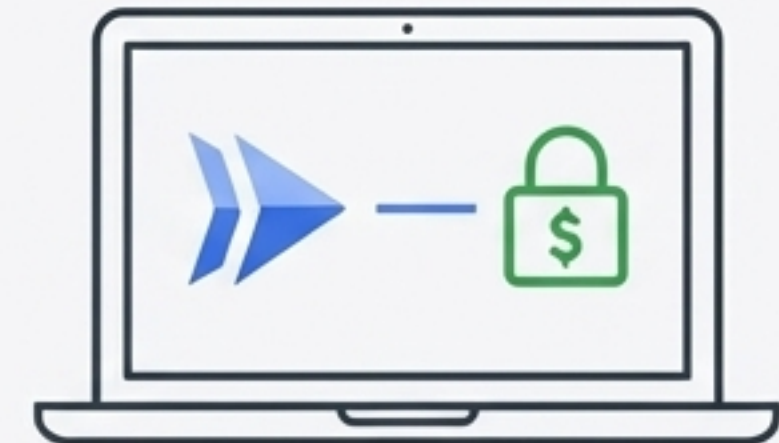
Select function -> Gemini prompt -> Generates boundary & error test cases (pytest) automatically in the IDE.

Emulated Test Isolation



Append UUIDs to Pub/Sub topics/subscriptions during test setup and teardown to prevent state leakage between tests.

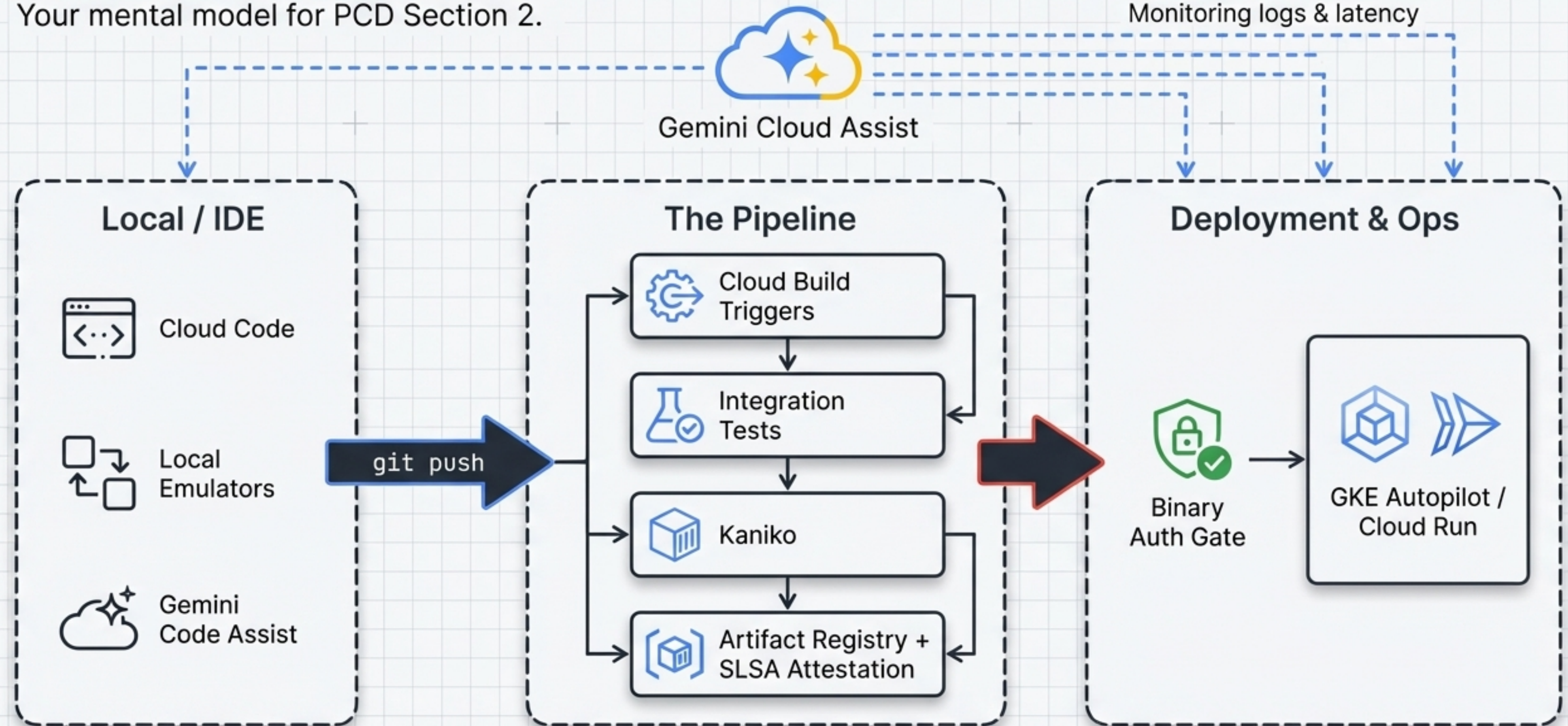
Local Cloud Run Testing



Use Cloud Code to run containers locally with exact production GCP environment environment variables and Secret Manager bindings.

The Google Cloud Developer Ecosystem Map

Your mental model for PCD Section 2.





Final Review Checklist

System Readiness Check

- Can you configure Application Default Credentials (ADC) without service account keys?
- Can you bypass Dockerfiles using source-based deployment (`--source .`)?
- Can you differentiate the use cases of Cloud Code, Cloud Shell, and Workstations?
- Do you know how to enforce SLSA provenance using Binary Authorization?
- Can you execute isolated integration tests using local GCP emulators and UUIDs?

> Access hands-on labs at <https://techequity.cloud>