

EDGELESS
SYSTEMS





Edgeless Systems

- **Product:** Confidential Computing software
- **Focus:** Open source
- Founded 2019
- ~10 engineers
- VC funded

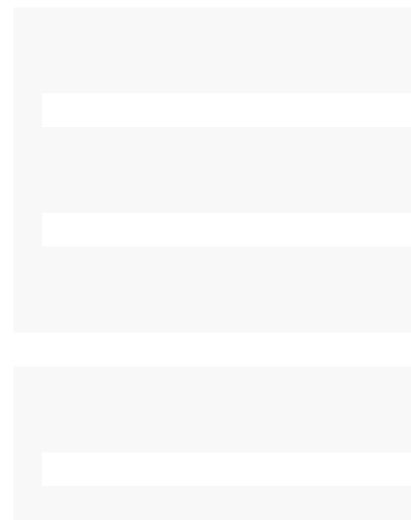
What is Confidential Computing?



There is no cloud



...just other people's computers



Microsoft Azure

Home / Solutions / Confidential Compute

Azure confidential computing

Protect and secure your cloud data while it's in use

Start free >

The screenshot shows the Microsoft Azure website's page for Confidential Computing. It features a dark blue header with the Azure logo and navigation icons. Below the header, there's a breadcrumb trail: Home / Solutions / Confidential Compute. The main content area has a large blue cloud icon with a white chip and lock symbol inside it. The text emphasizes protecting and securing cloud data in use, with a prominent green 'Start free' button.

Google Cloud

Contact Us Get started for free

JUMP TO

Confidential Computing

Encrypt data in-use with Confidential VMs and Confidential GKE Nodes

Try Google Cloud free

Breakthrough technology that allows you to encrypt data in use—while it's being processed

The screenshot shows the Google Cloud website's page for Confidential Computing. It has a white header with the Google Cloud logo and navigation icons. Below the header, there are two buttons: 'Contact Us' and 'Get started for free'. A 'JUMP TO' section is visible, followed by the main heading 'Confidential Computing'. The text describes the technology as a way to encrypt data in use with Confidential VMs and Confidential GKE Nodes. A blue 'Try Google Cloud free' button is present, along with a green checkmark icon and a paragraph describing the technology as a breakthrough for encrypting data in use.

IBM Cloud Data Shield

Enable runtime memory encryption for Kubernetes containers, without modifying applications

Chat with an expert

The screenshot shows the IBM Cloud Data Shield page. It has a dark background with a network diagram. The main heading is 'IBM Cloud Data Shield'. Below it, the text describes the service as enabling runtime memory encryption for Kubernetes containers without modifying applications. A white button labeled 'Chat with an expert' is located at the bottom.

Solution: Process data in secure enclaves.

Forbes

45,029 views | Sep 21, 2020, 05:15pm EDT

Top 10 Digital Transformation Trends For 2021

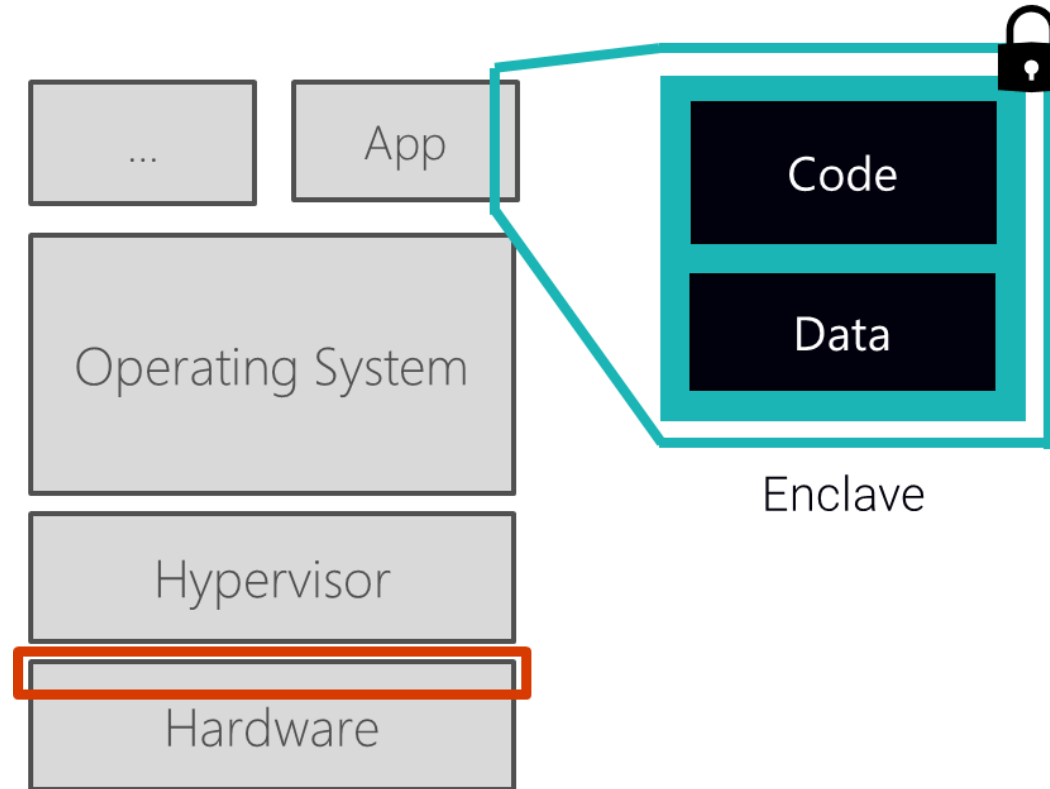
Privacy and Confidential Computing Gains Momentum

Another approach to shoring up cybersecurity, particularly when addressing communications and data privacy, is confidential computing. The idea of confidential computing is to encrypt the entire computing process, not just the data, creating additional layers of security around

The screenshot shows a snippet from a Forbes article. The Forbes logo is at the top left. Below it, the article's view count and date are shown. The main heading is 'Top 10 Digital Transformation Trends For 2021'. A sub-heading reads 'Privacy and Confidential Computing Gains Momentum', with 'Confidential Computing' highlighted in a light blue box. The text below discusses confidential computing as a cybersecurity approach that encrypts the entire computing process.

**Our cloud will be fully confidential
in 5 years**
-Cloud security manager

Solution: Process data in secure enclaves.



Solution: Process data in secure enclaves.

Enclaves have 4 defining security properties...



Isolation



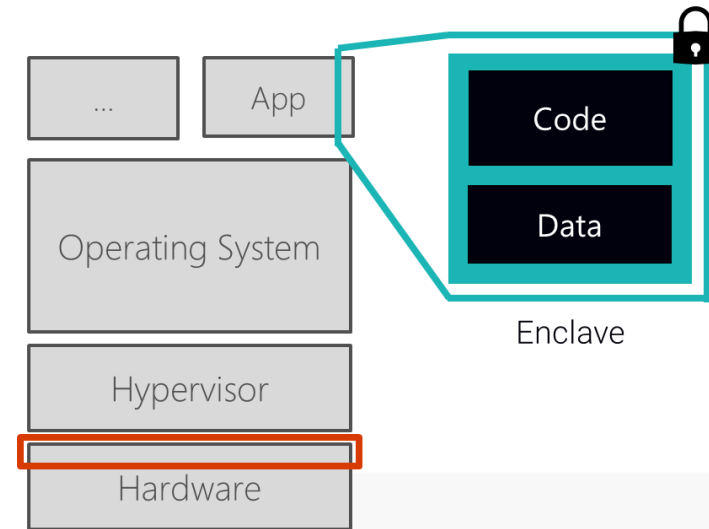
Runtime memory-encryption



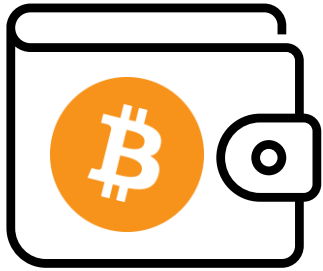
Sealing



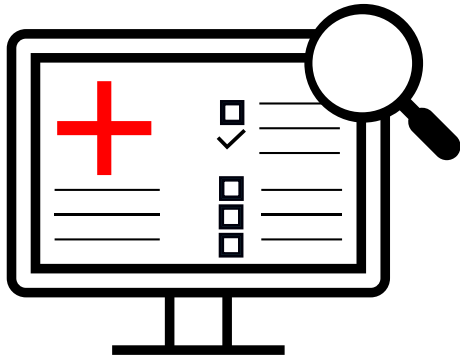
Remote attestation



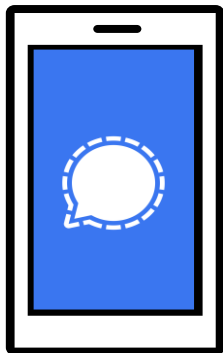
Use case examples



Hardware wallet without special hardware
Privacy-preserving payments networks (MobileCoin)



E-Health (electronic health records (eHR))

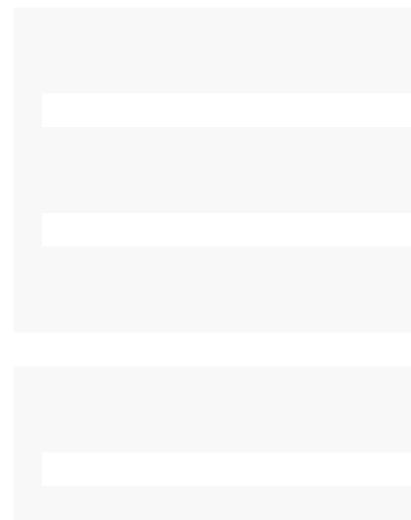
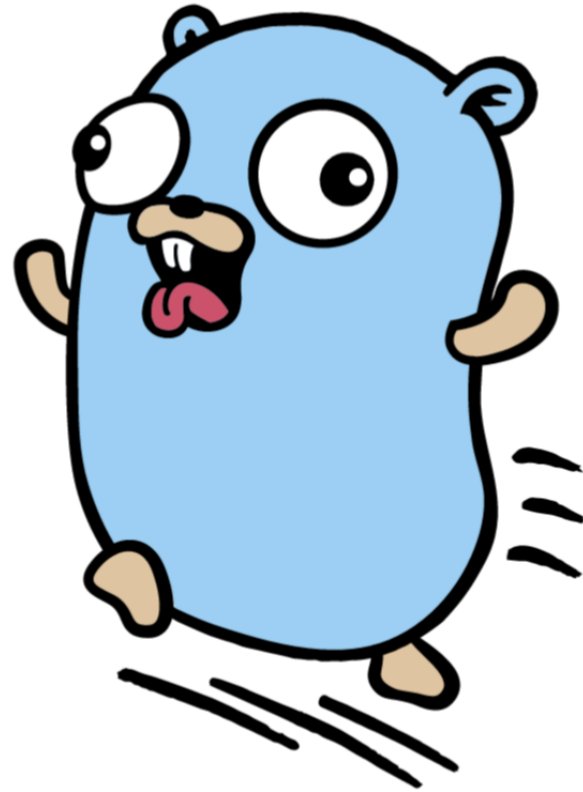


Messenger contact discovery (Signal)



EGo makes it *easy* to build CC
apps in Go

Why Go?

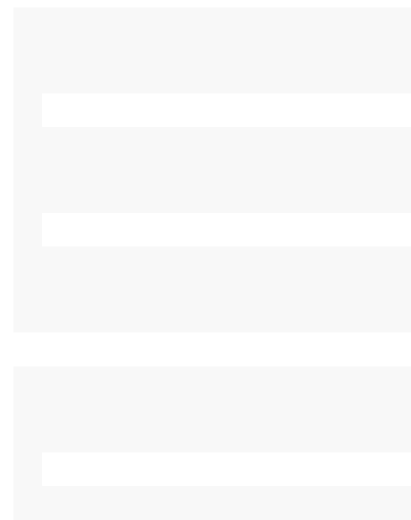




EGo in a nutshell

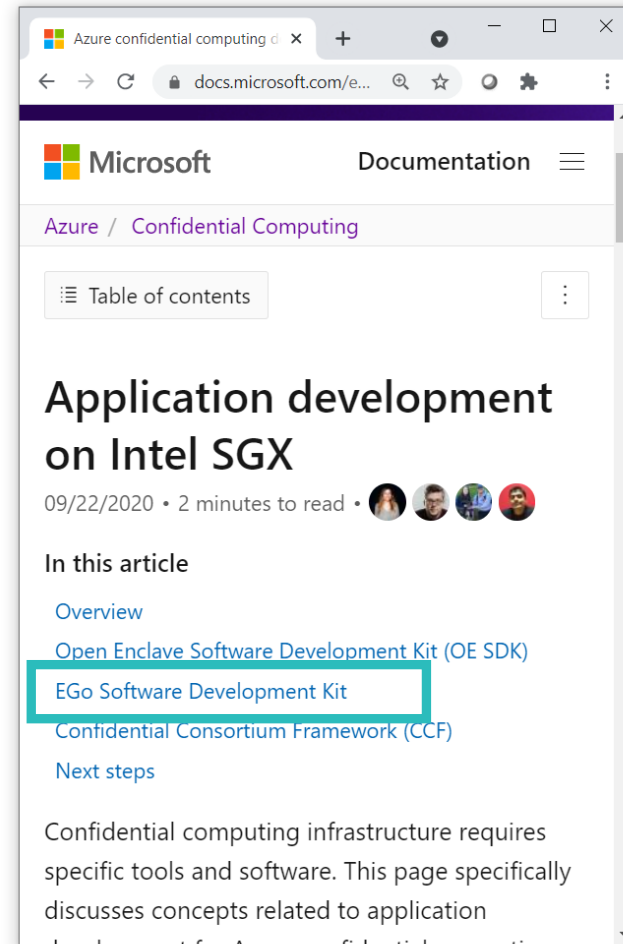
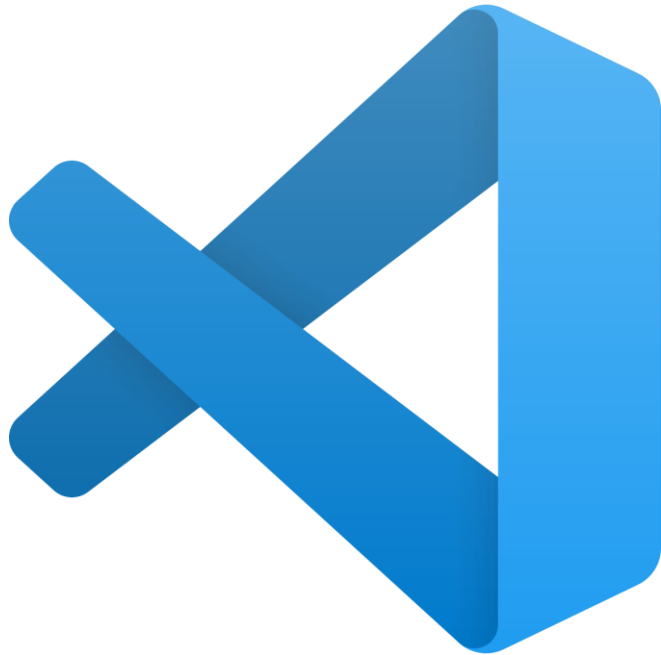
- Modified Go compiler
- SGX-specific tooling
- Inside-enclave and outside-enclave libraries

```
• • •
$ sudo snap install ego-dev --classic
$ ego-go build helloworld.go
$ ego sign helloworld
$ ego run helloworld
Loading enclave...
Entering enclave...
Hello from enclave!
```

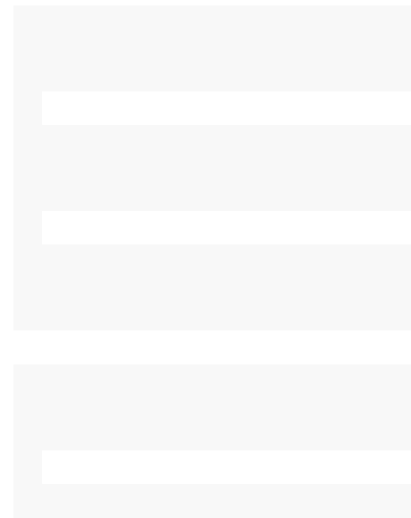
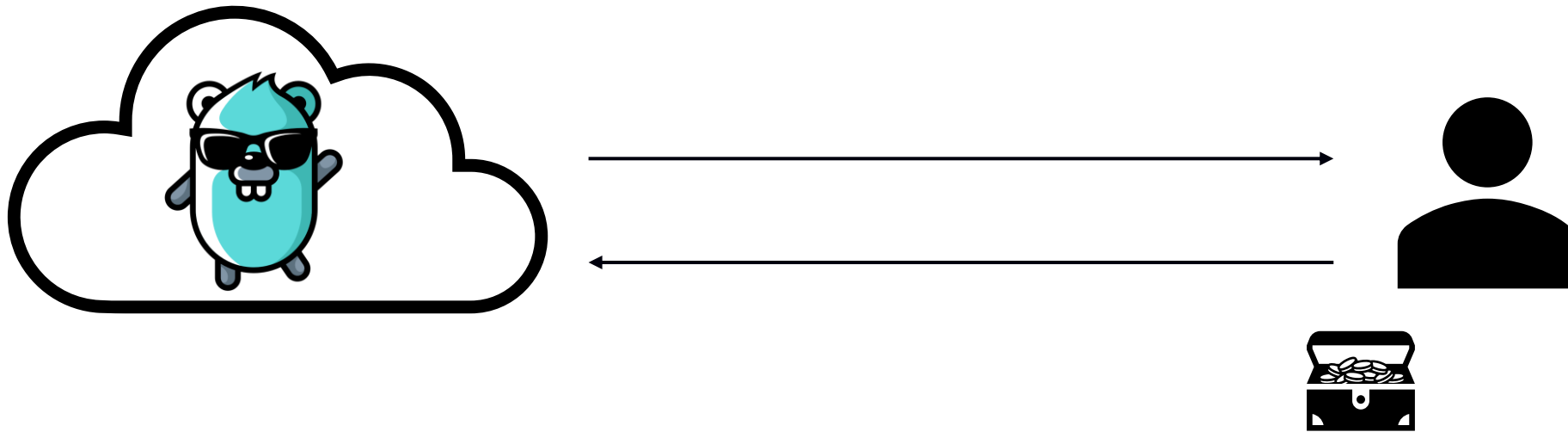




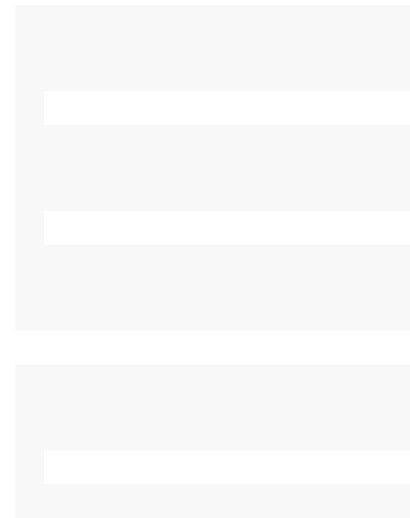
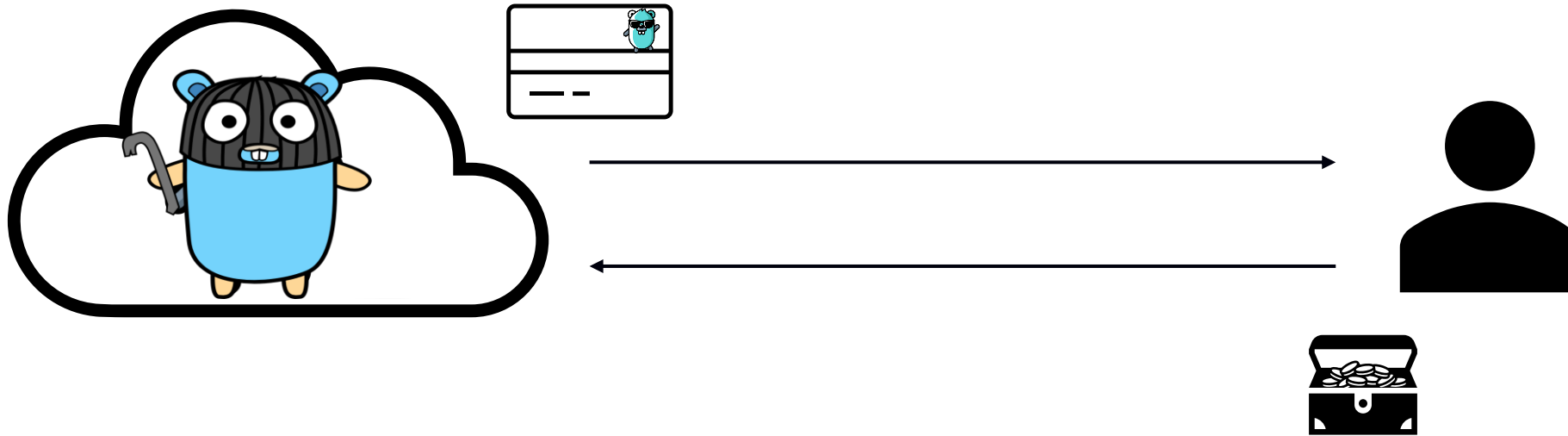
Works great with your favorite tools and clouds



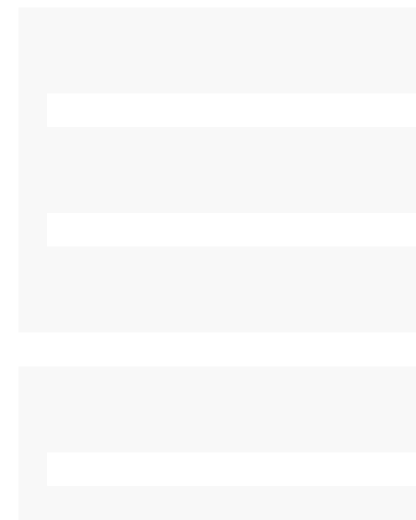
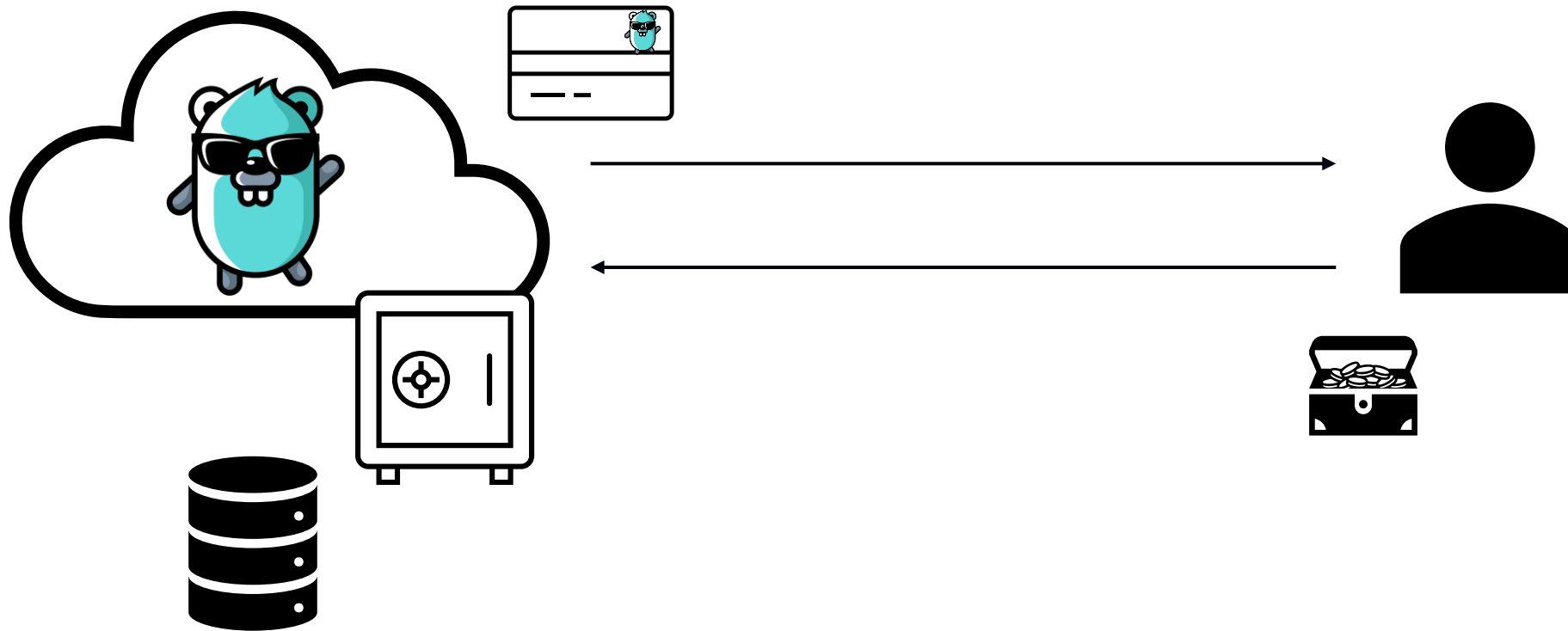
Demo: Hello World



Demo: Remote Attestation

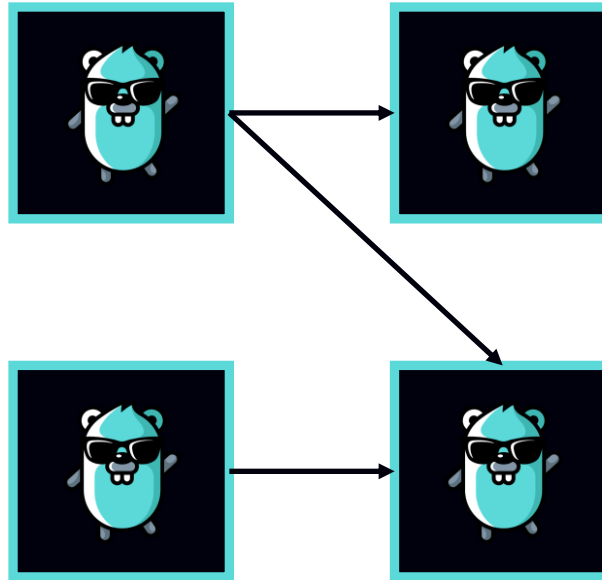


Demo: Sealing



Deploying CC with Marblerun

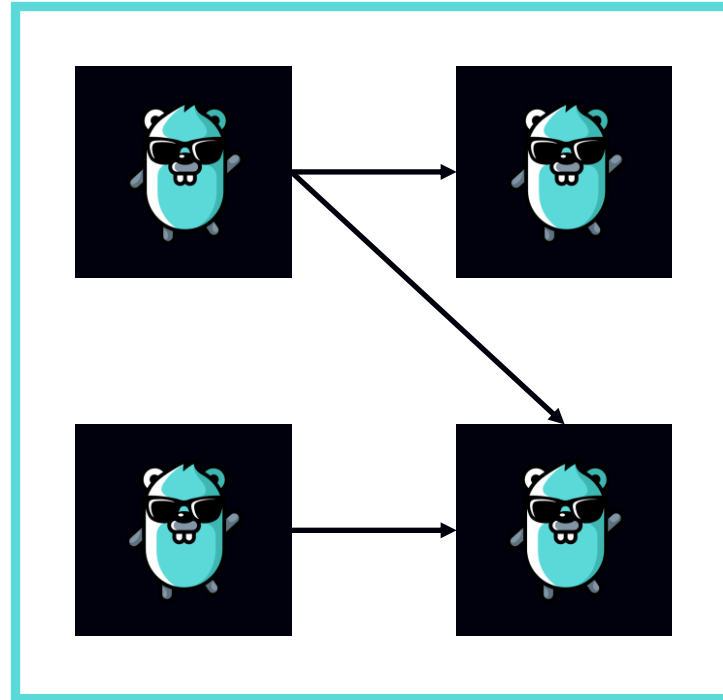
Marblerun extends the enclave concept to your cluster



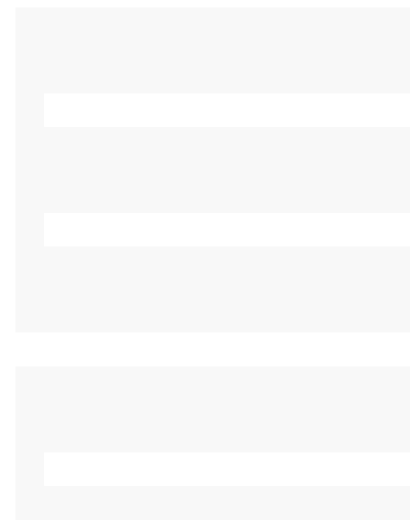
Marblerun extends the enclave concept to your cluster

- ✓ E2E confidentiality
- ✓ E2E integrity
- ✓ E2E verifiability

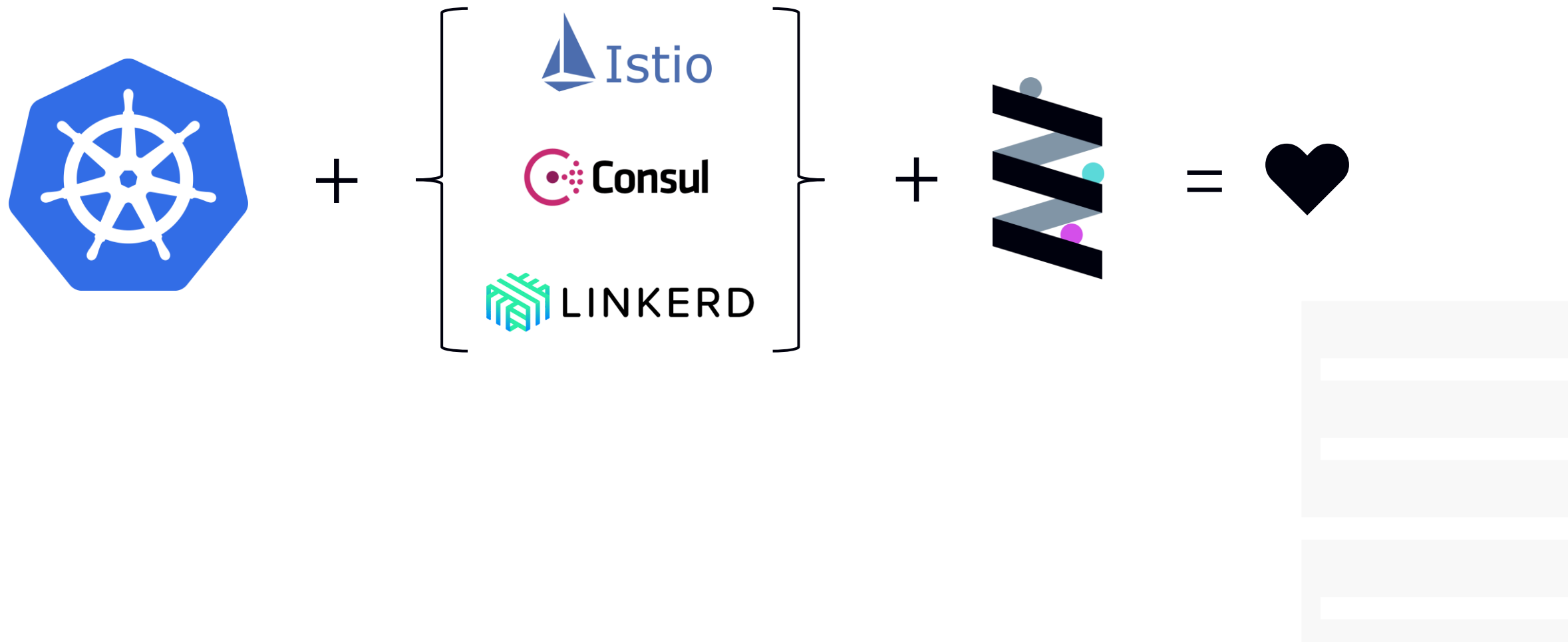
- ✓ Updatable
- ✓ Cloud-native



MARBLERUN



Marblerun augments existing service meshes with CC



Conclusion

