



# Confidential Cloud Computing



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<https://cloudforest.cloud>

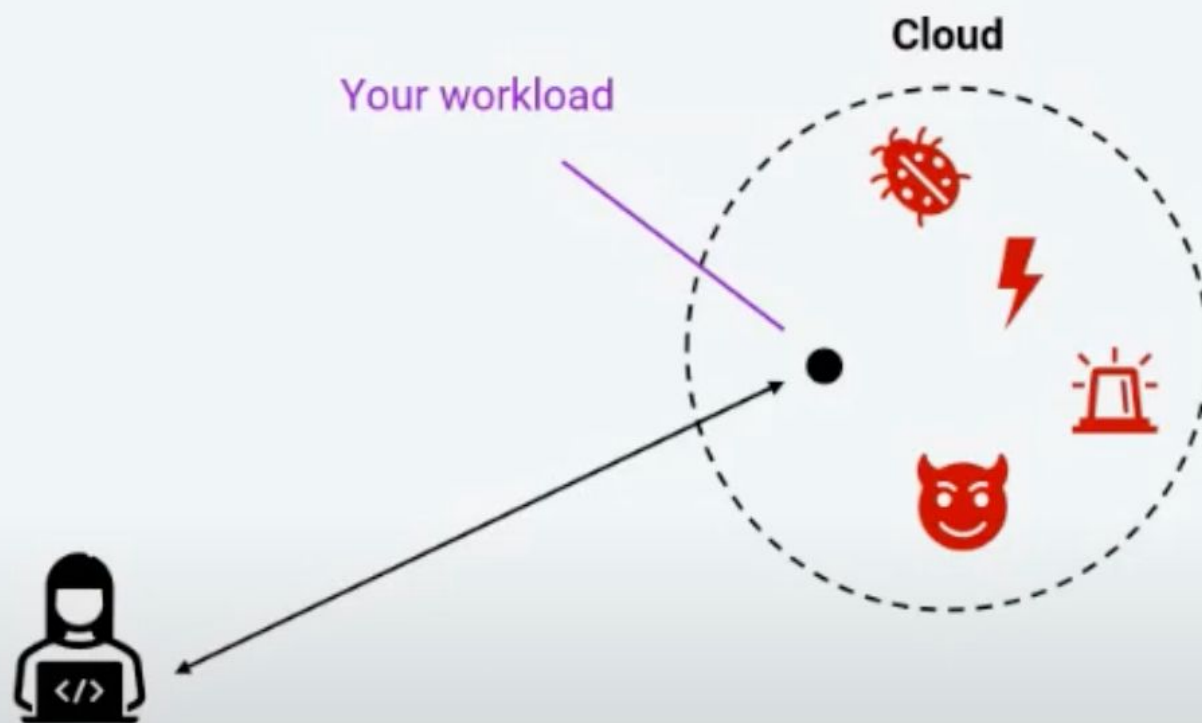


Konvergence



# The Problem

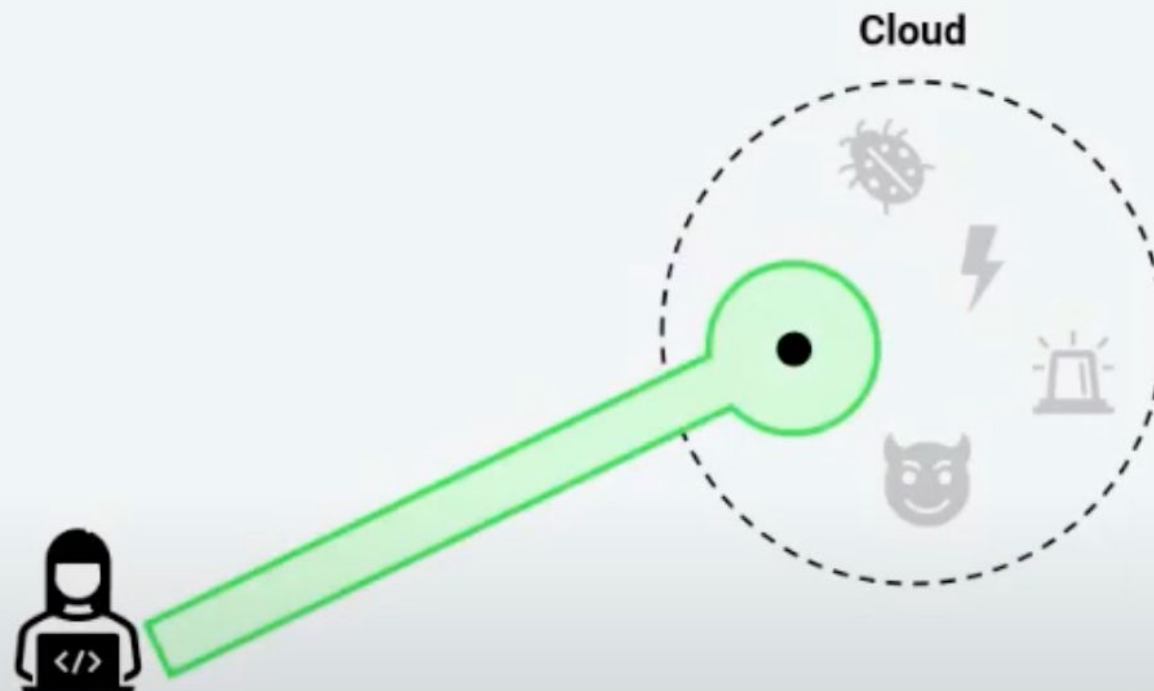
**How to securely process data on someone else's computer?**



<https://www.youtube.com/watch?v=UQLnqt5Js0Q>

# Thoughtful Solutions

## Confidential computing solves this



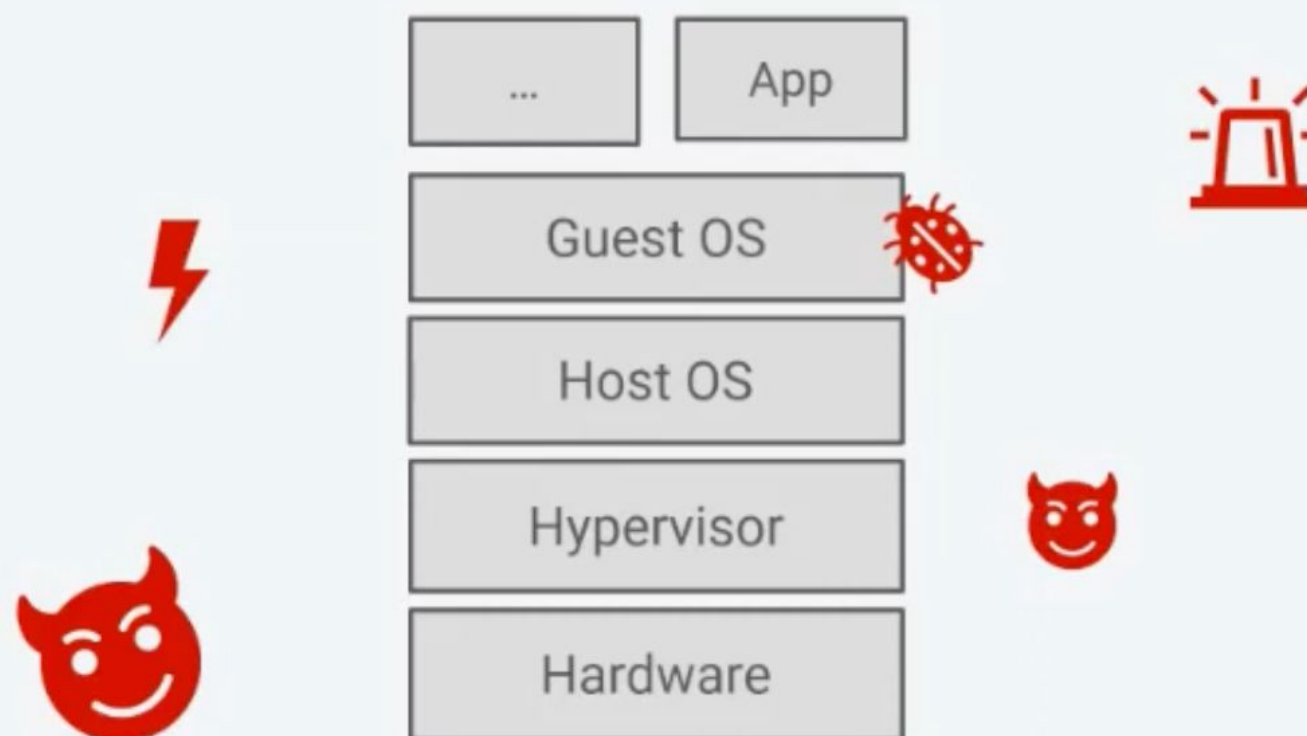
<https://www.youtube.com/watch?v=UQLnqt5Js0Q>





# Stack Vulnerabilities

## Threats everywhere

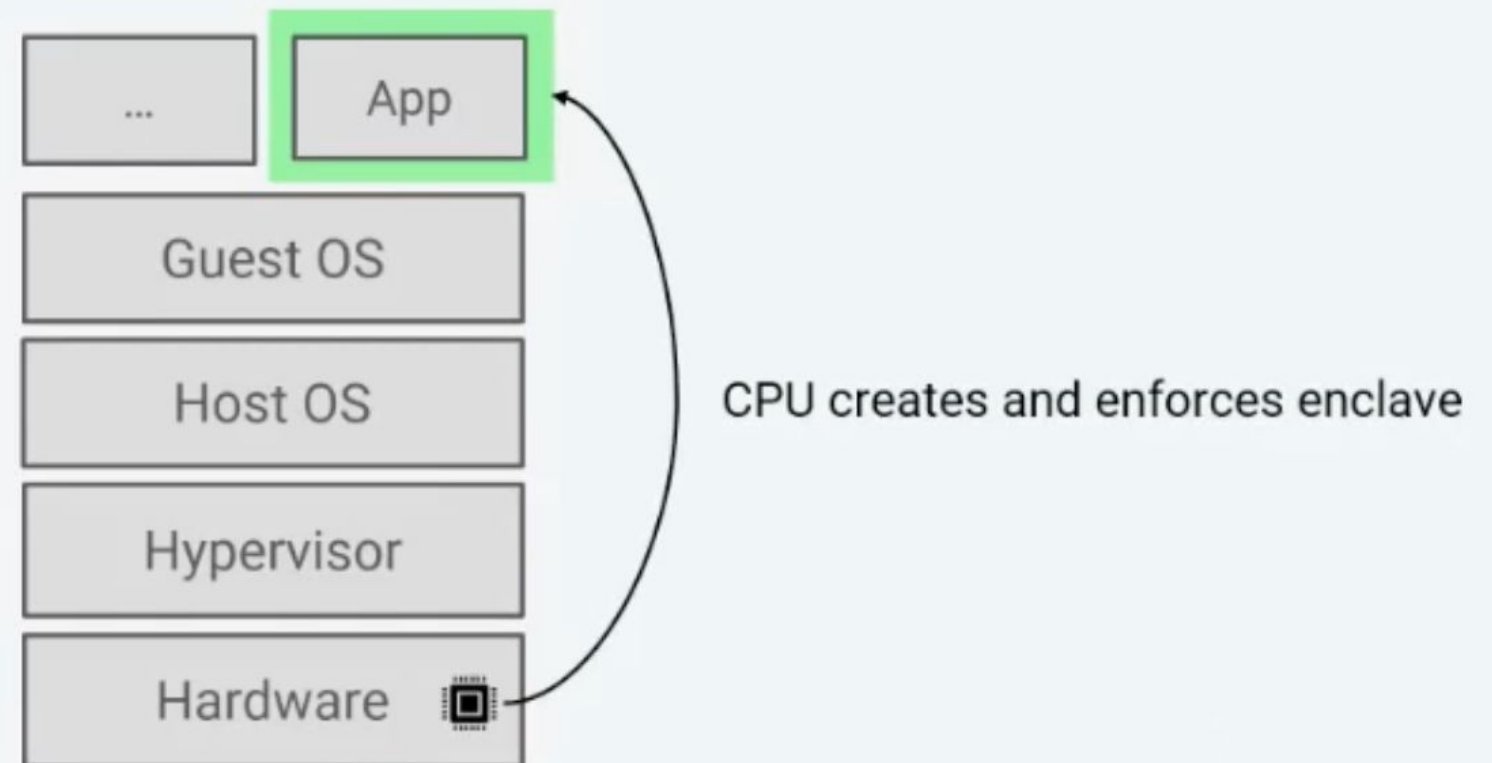


<https://www.youtube.com/watch?v=UQLnqt5Js0Q>



# Secure Enclaves Solution

## Secure enclaves



Intel Software Guard Extensions (SGX), AMD Secure Encryption Virtualization (SEV), and AWS Nitro Enclaves

<https://www.youtube.com/watch?v=UQLnqt5Js0Q>

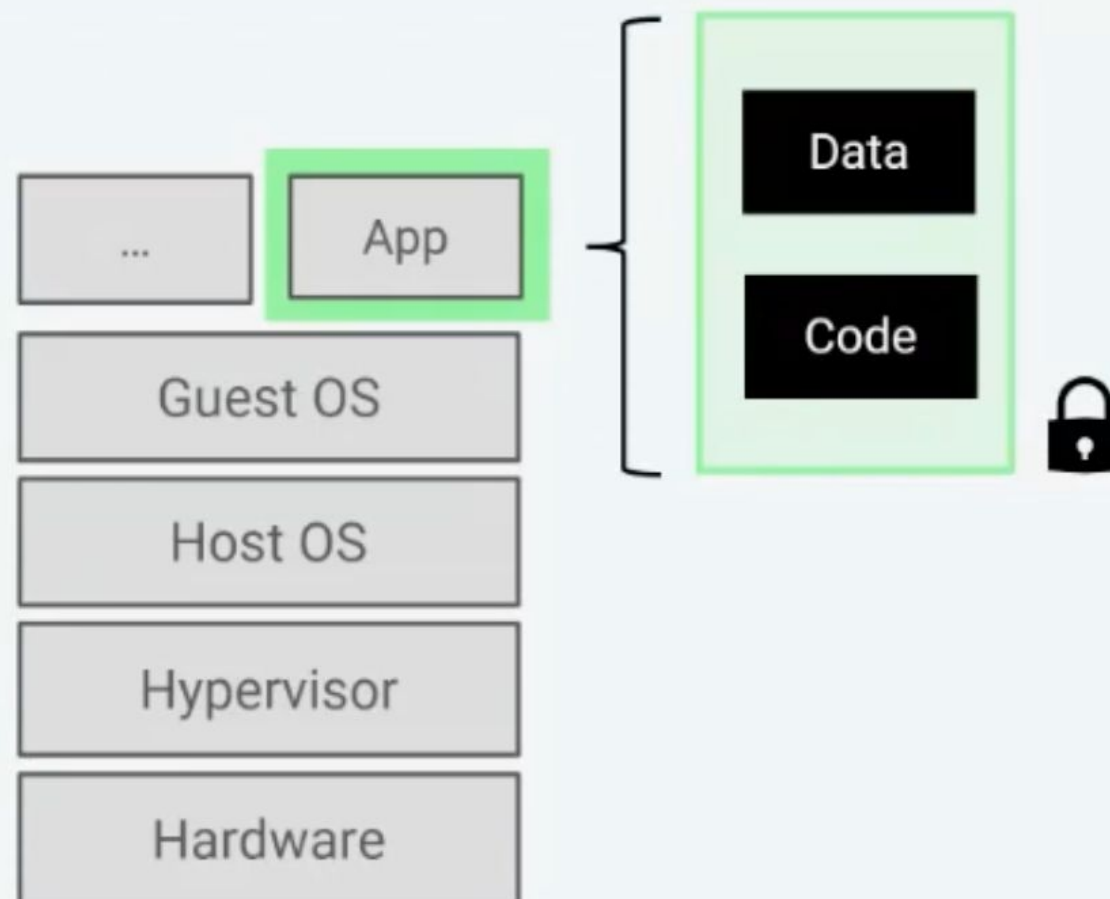




# Various Implementations

## Secure enclaves

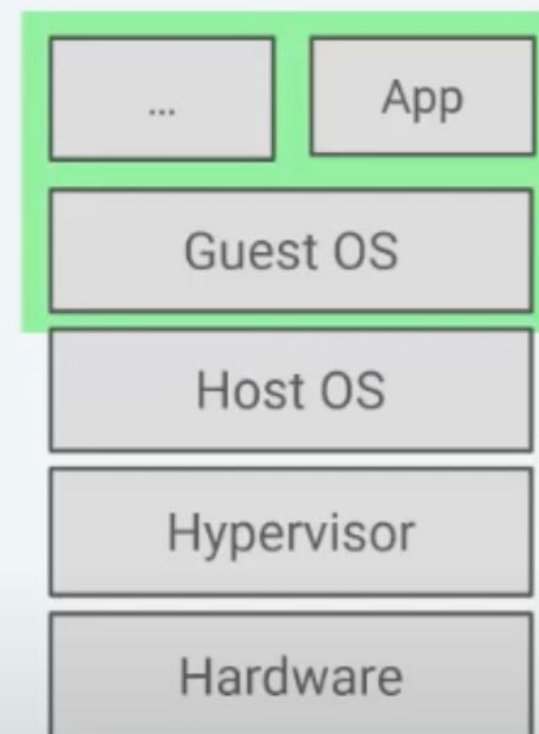
Intel SGX



# Various Implementations (cont.)

## Confidential VMs

AMD SEV  
Intel TDX  
Arm Realms





# Primary Use-Cases

## Use cases for confidential computing

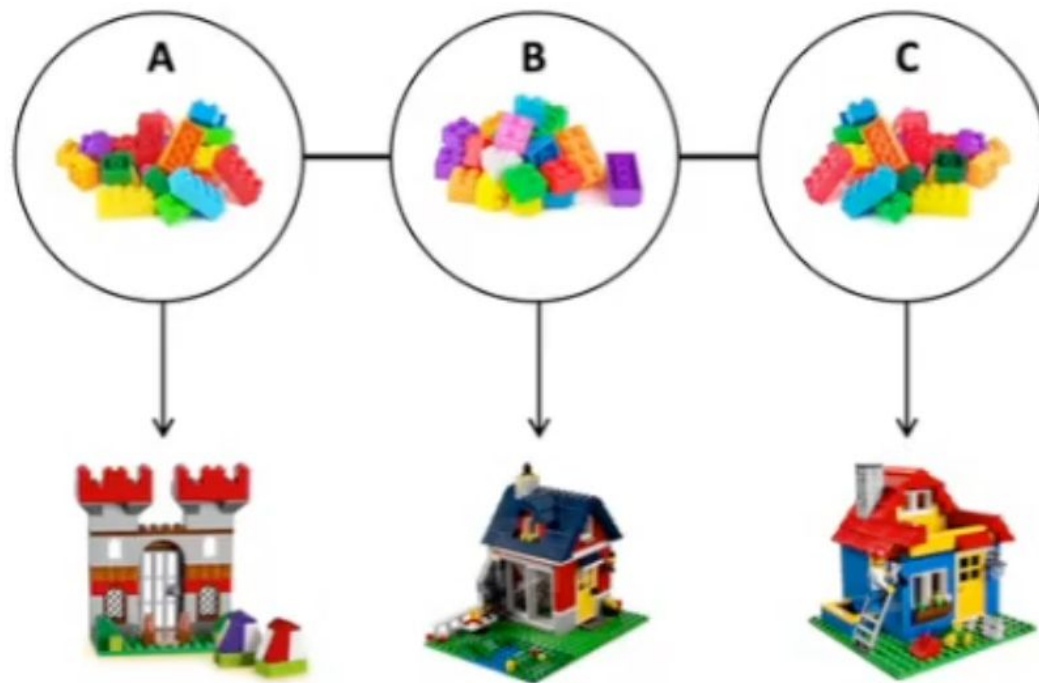
1. Enable multi-party data sharing
2. Prevent data breaches



# Data Co-Ops, Data DAOs

## Data Cooperative Concept

Without Data Sharing and Collaboration



With a Privacy Preserving Data Cooperative



studio.streamyard.com is sharing your screen. Stop sharing Hide

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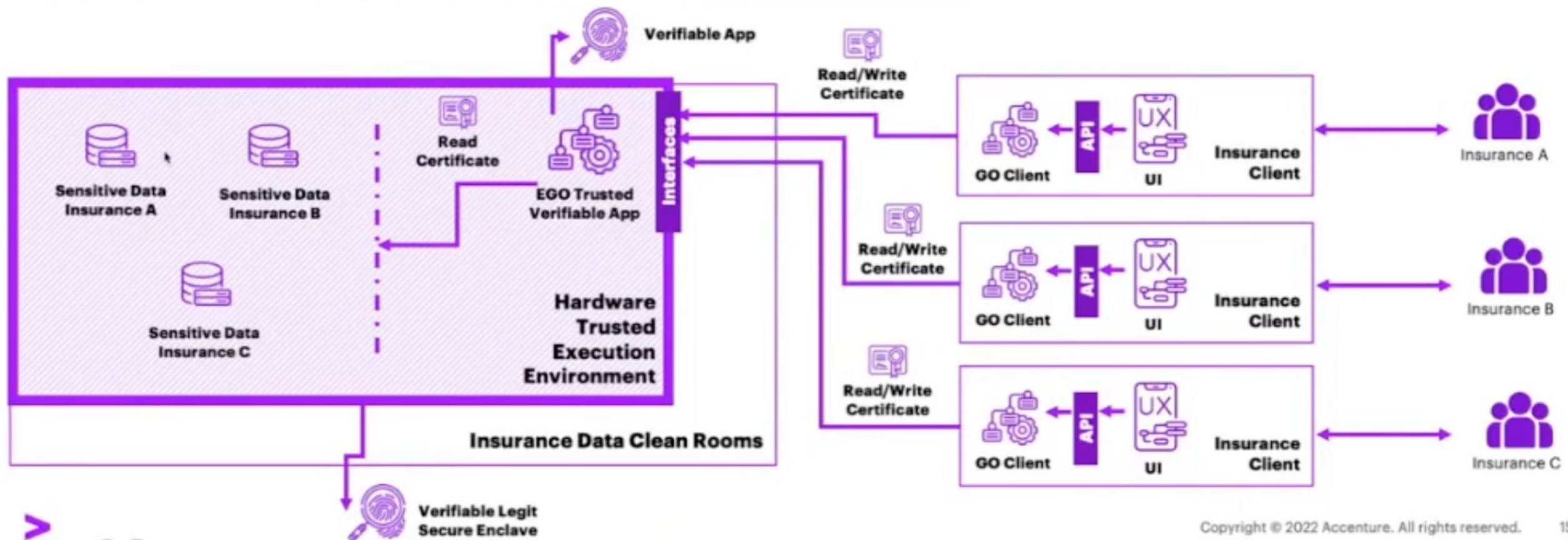
4

# Example Use-Case

## INSURANCE CLAIM FRAUD DETECTION

# Data Clean Rooms for Insurance Fraud Detection

- Insurances Sensitive Data are protected in transit, at rest, and in use
- Only the Ego Trusted Verifiable App, that is running in the enclave, **can read and compute over the sensitive data**
- Insurance A, B & C need to **share with the EGO Trusted App a read/write certificate** to read and update their respective Database. The certificates authorize the insurances only to interact with their own Database
- The Ego Trusted Verifiable App can read and compute over the Database to detect the Fraud indicators. **The operations are securely running in the enclave and the decrypted data are not visible and accessible even during the computation.**
- The Secure Enclave and the EGO Trusted App are verifiable at any moment by the participants to guarantee that they are interacting with a legit Secure Enclave and with an application that is trusted and is not exposing confidential data







# Open Source Confidential Computing Systems

## Our open-source products

The first always-encrypted Kubernetes.



**Constellation**

The most loved dev tools.



EGo SDK



MarbleRun



EdgelessDB

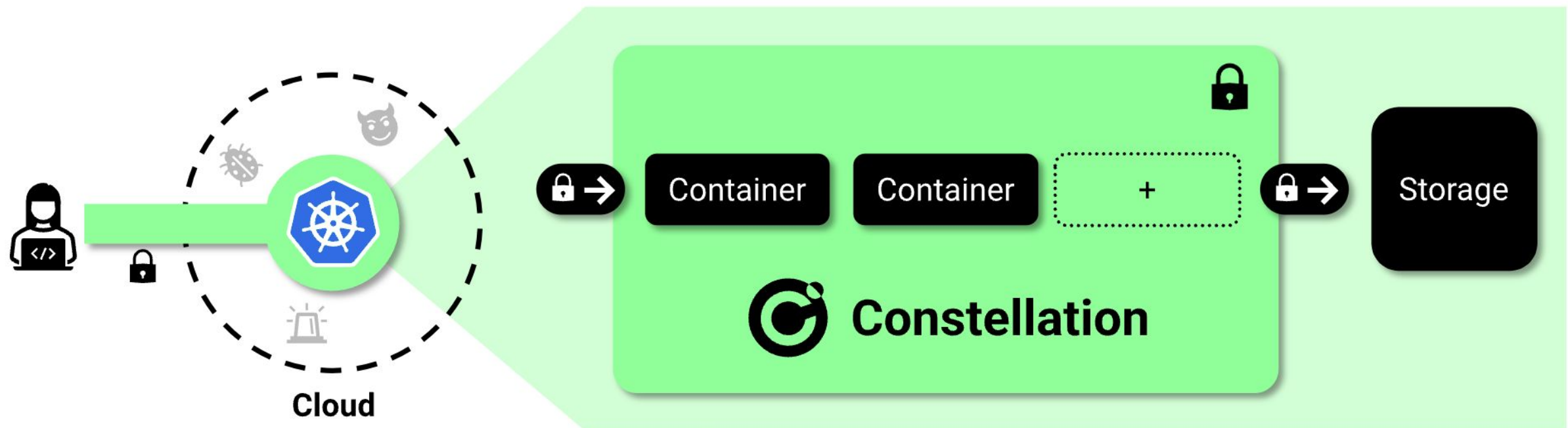
<https://www.edgeless.systems/products/constellation>

<https://www.youtube.com/watch?v=UQLnqt5Js0Q>



# Native In-Memory Encrypted Kubernetes Clusters

Welcome to the documentation of Constellation! Constellation is a Kubernetes engine that aims to provide the best possible data security.



Constellation shields your entire Kubernetes cluster from the underlying cloud infrastructure. Everything inside is always encrypted, including at runtime in memory. For this, Constellation leverages a technology called *confidential computing* and more specifically Confidential VMs.

<https://www.edgeless.systems/products/constellation>

<https://www.youtube.com/watch?v=UQLnqt5Js0Q>



# As Easy as Normal Kubernetes

All it takes are two commands



```
constellation create <cloud> <initial size>
constellation init

kubect1 [scale anything!]
```

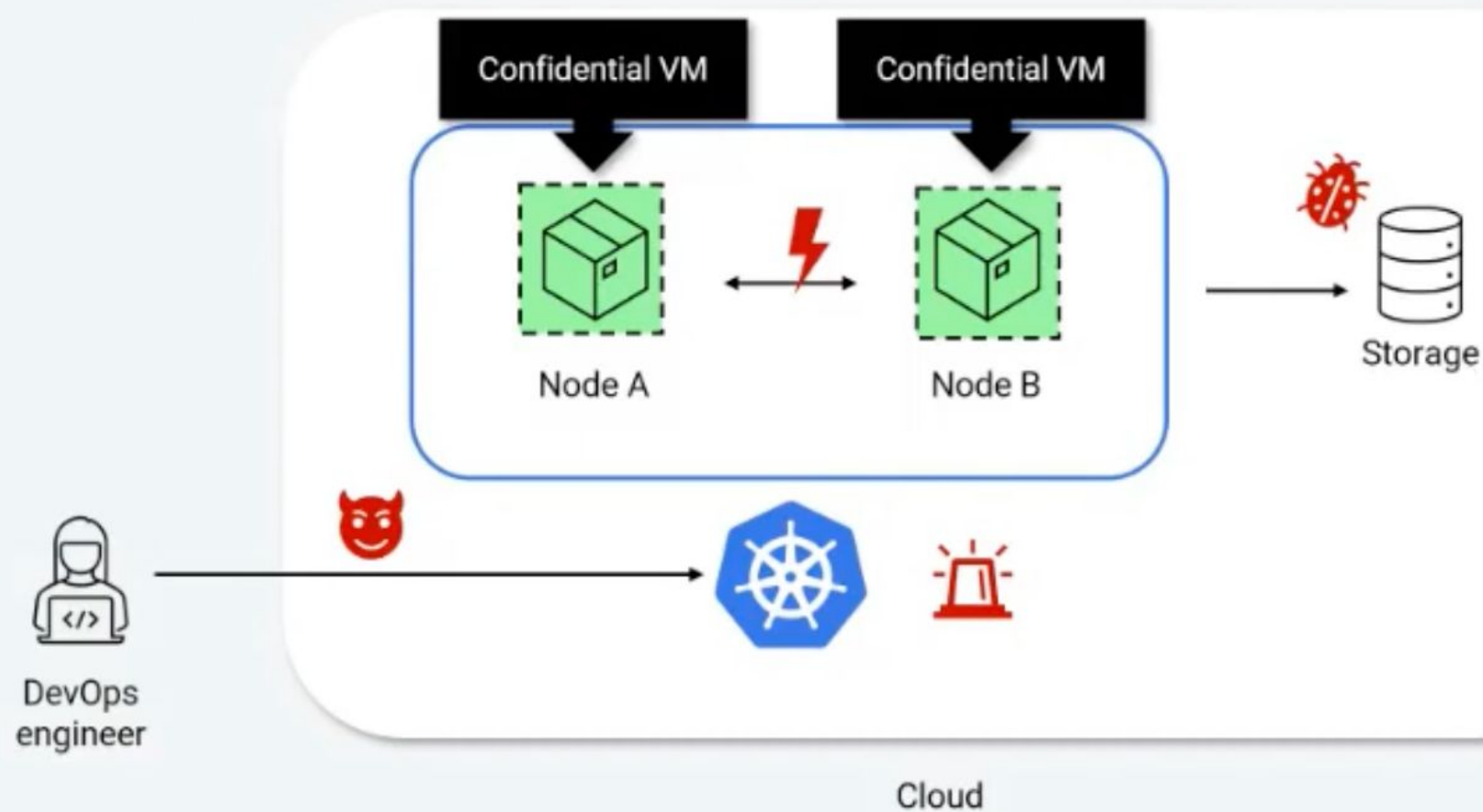
<https://github.com/edgelessys/constellation>

<https://www.youtube.com/watch?v=UQLnqt5Js0Q>



# Overview

## Without Constellation, you only get a Confidential VM

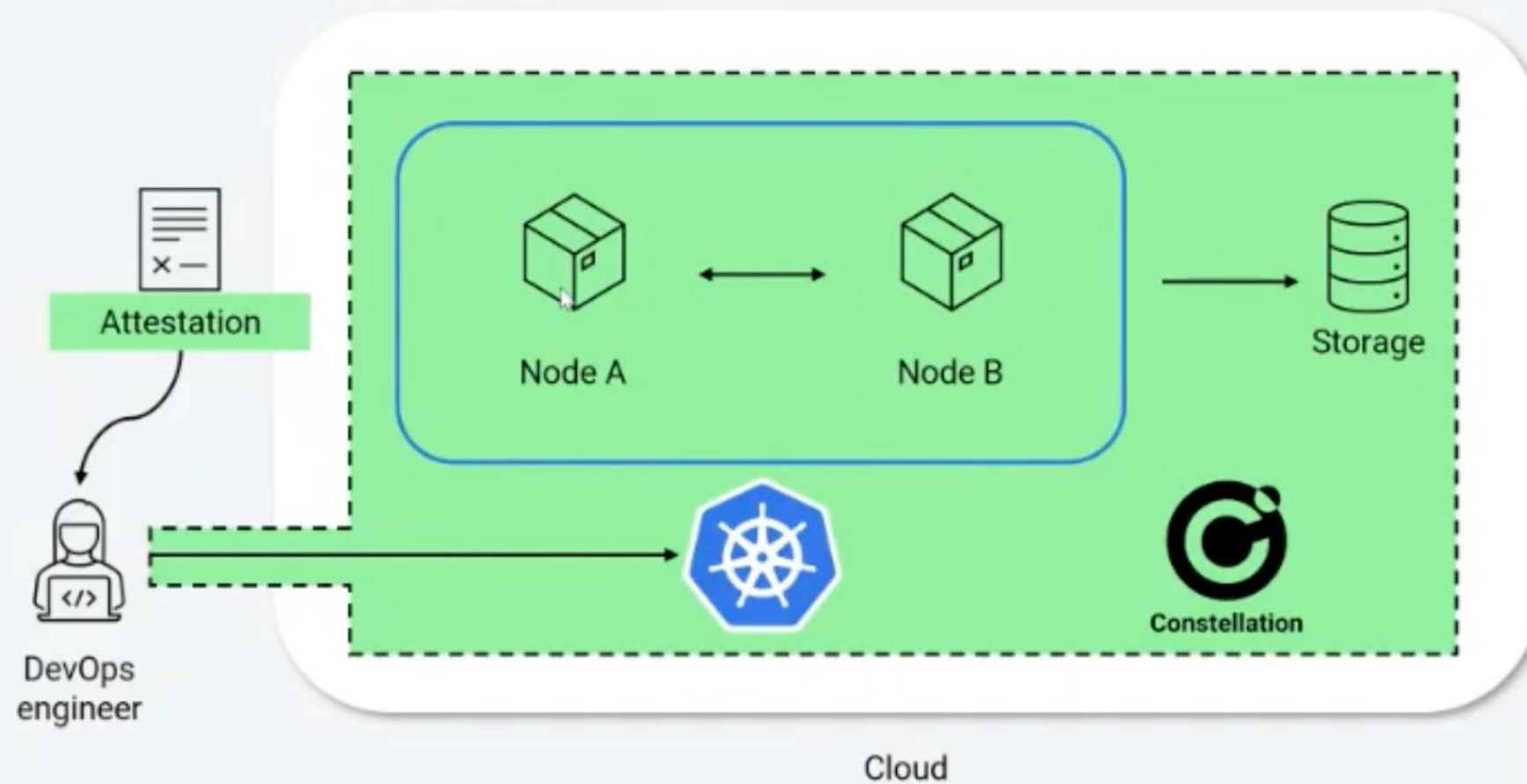


<https://github.com/edgelessys/constellation>

<https://www.youtube.com/watch?v=UQLnqt5Js0Q>

# Overview

## With Constellation, you get E2E Confidential Kubernetes



<https://github.com/edgelessys/constellation>

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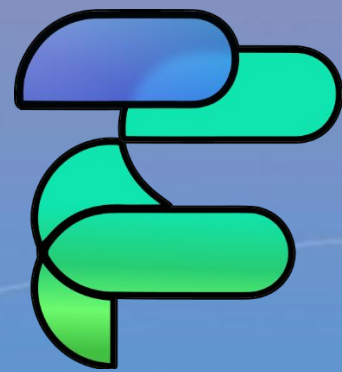
# Survey

- Filecoin Orbit Community Program Survey



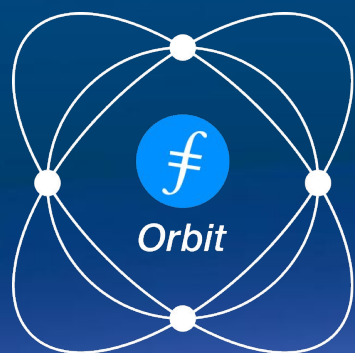


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