SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

How to Easily Deploy Confidential Computing

Live Webcast

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Today's Presenters

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Co-founder & CTO
Fortanix

SNIA-at-a-Glance

180
industry leading organizations

2,500
active contributing members

50,000
IT end users & storage pros worldwide

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SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

What We Do

Educate vendors and users on cloud storage, data services and orchestration

Support & promote business models and architectures: OpenStack, Software Defined Storage, Kubernetes, Object Storage

Understand Hyperscaler requirements Incorporate them into standards and programs

Collaborate with other industry associations

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Agenda

- Confidential computing problem scope and vision
- Cost-effective benefits of available and easily deployable solutions
- Real-world confidential computing examples
- Confidential computing demonstrations
- Buyer's guide: things to look for in your confidential computing solution

Steve Van Lare

Vice President, Engineering

Anjuna Security

The World Runs on Secrets

…we haven't been very good at keeping them….ever.

- Israel Defense Forces Cybersecurity:
  - Keep data safe in insecure areas.
- Open DNS SaaS: Customer key existential business risks
- Stanford Research: Model exists…without real-world support
- Secure enclave technologies released creating an opportunity….

Confidently run "good guy" workloads over "bad guy" infrastructure.

Vision is to Make Confidential Compute Easy for Enterprises

- Establish a simple software construct: The Confidential Cloud
- Eliminate excess data overexposure
- Maintain app, data and IT/Business process continuity (no changes)

All the advantages of public infrastructure.

All the security of private hardware.

Everywhere!

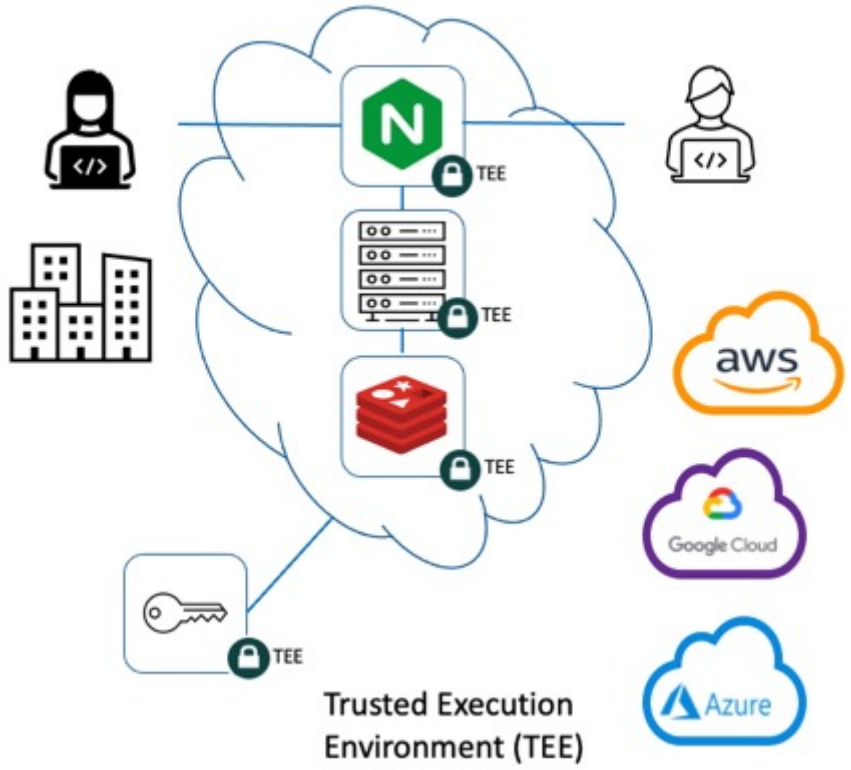
Threats Confidential Compute Protects Against

- Insiders
- External bad actors
- Malware
- Horizonal attacks
- Unauthorized Data Access
- Code Tampering
- Memory dumps

From Open to Zero Trust Computing

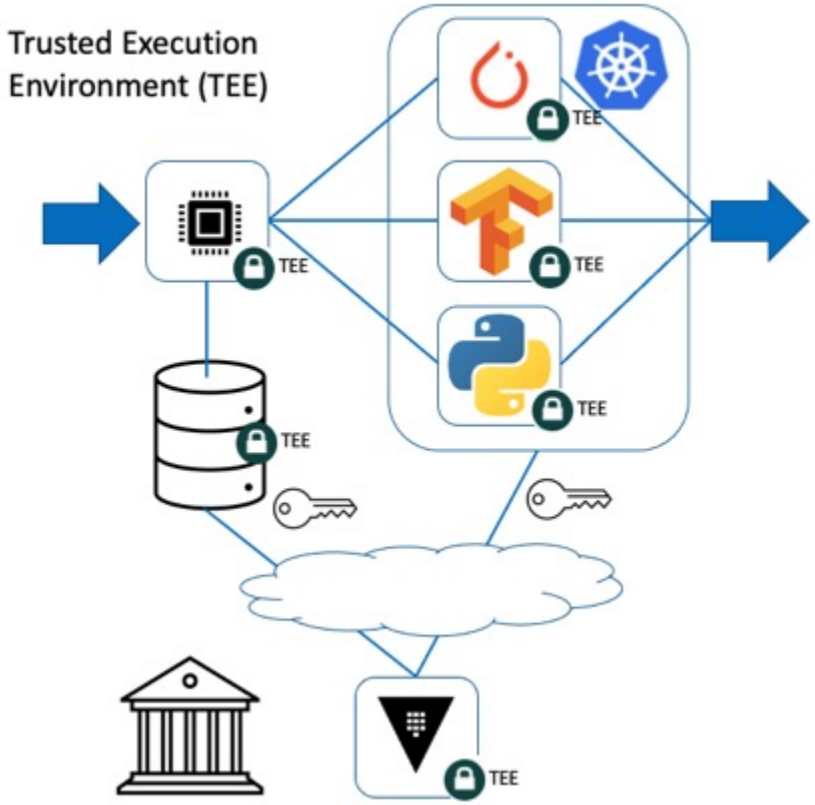
Government To Move Thousands Sensitive Applications to the Cloud

- **Opportunity**
  - Move sensitive apps to the cloud to save money on compute, infrastructure and staff.
- **Challenge**
  - Confidential Computing Technology required app rewrite and enclave tech expertise.
- **Solution**
  - Confidential Cloud establishes data perimeter around app/data/storage environment.
  - No changes to app or ops needed.
  - Leverage existing infrastructure including Key management systems.
- **Outcome**
  - Achieved simple repeatable cloud deployment, highest security and cloud-economics.
  - Pipeline of thousands of app migrations to “more secure than on site” environment.



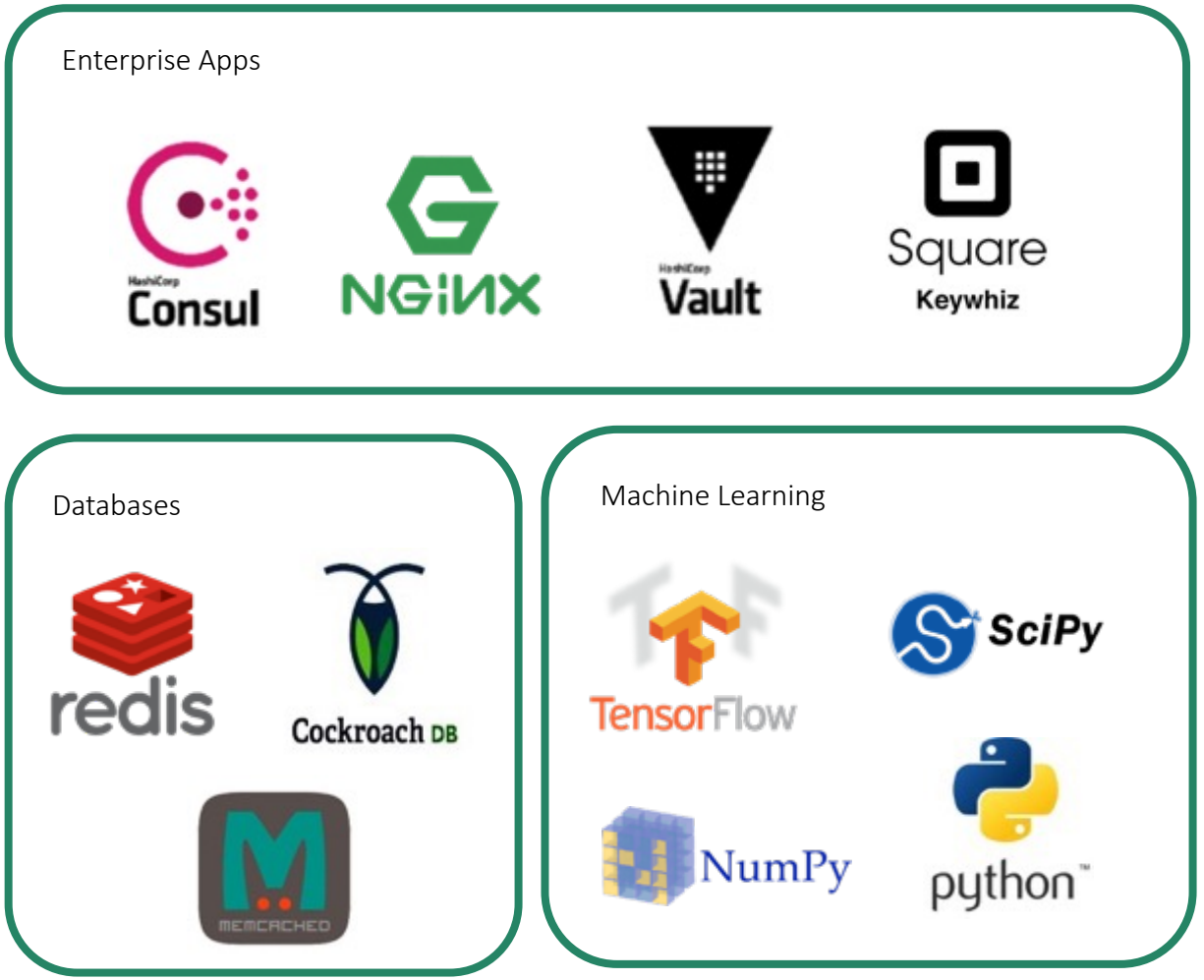
Bank Needs Hybrid Key Management and Confidential Compute Platform for Large App Portfolio

- **Opportunity**
  - App migration to hybrid cloud.
    Key management consolidation to HashiCorp hybrid
- **Challenge**
  - Secure hybrid workloads w/o HSM cost, limitations and complexity.
  - Leverage foundation for large application portfolio.
- **Solution**
  - A simple single key management solution across all clouds.
  - Confidential Cloud established as computing construct for all applications
- **Outcome**
  - Far lower cost and operational complexity with software vs. HSM. Expand beyond keys.



Zero to Confidential Cloud in 3 Minutes

1. Run an existing Redis database unprotected
2. Run in a Confidential Cloud
3. Try to breach data perimeter



Demonstration

Anand Kashyap

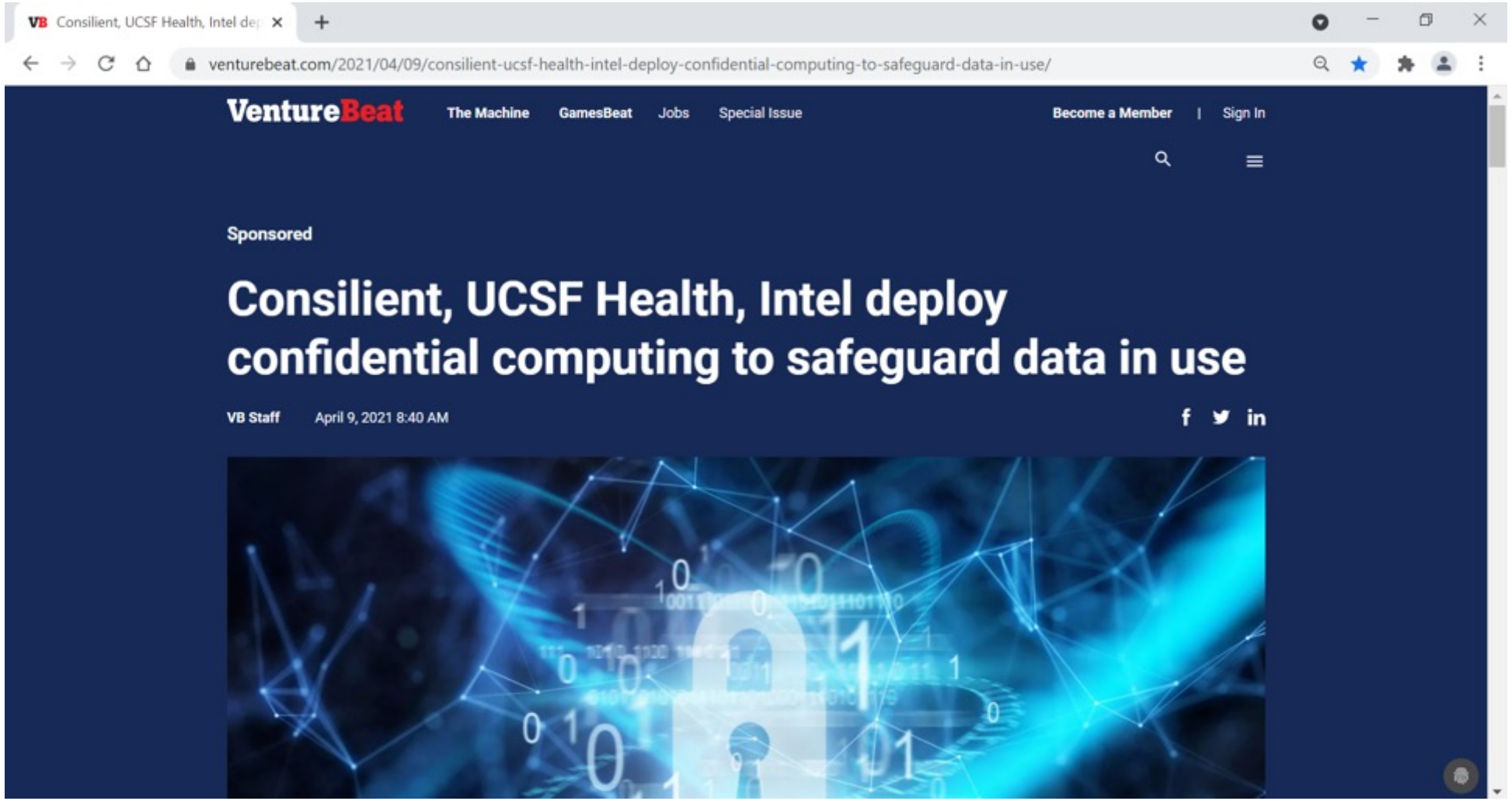
Co-founder & CTO

Fortanix

Vision and Perspective

- Problem
  - Confidential Computing – and other privacy-enhancing technologies (PETs) – need to integrate seamlessly with existing data and application workflows and scale according to requirements.
- Vision
  - Confidential Computing will be ubiquitous within cloud and on-premises compute resources.
  - Users can easily migrate workloads and develop applications across all available resources.
- Benefits
  - Data and application security can now be achieved at scale through close integration of Confidential Computing services with cloud architecture and data services.
  - Costs of deployment will diminish as Confidential Computing becomes a default method of deployment in the cloud and an integrated capability of OEM hardware.
  - End-to-end data security and applications control throughout the data lifecycle.

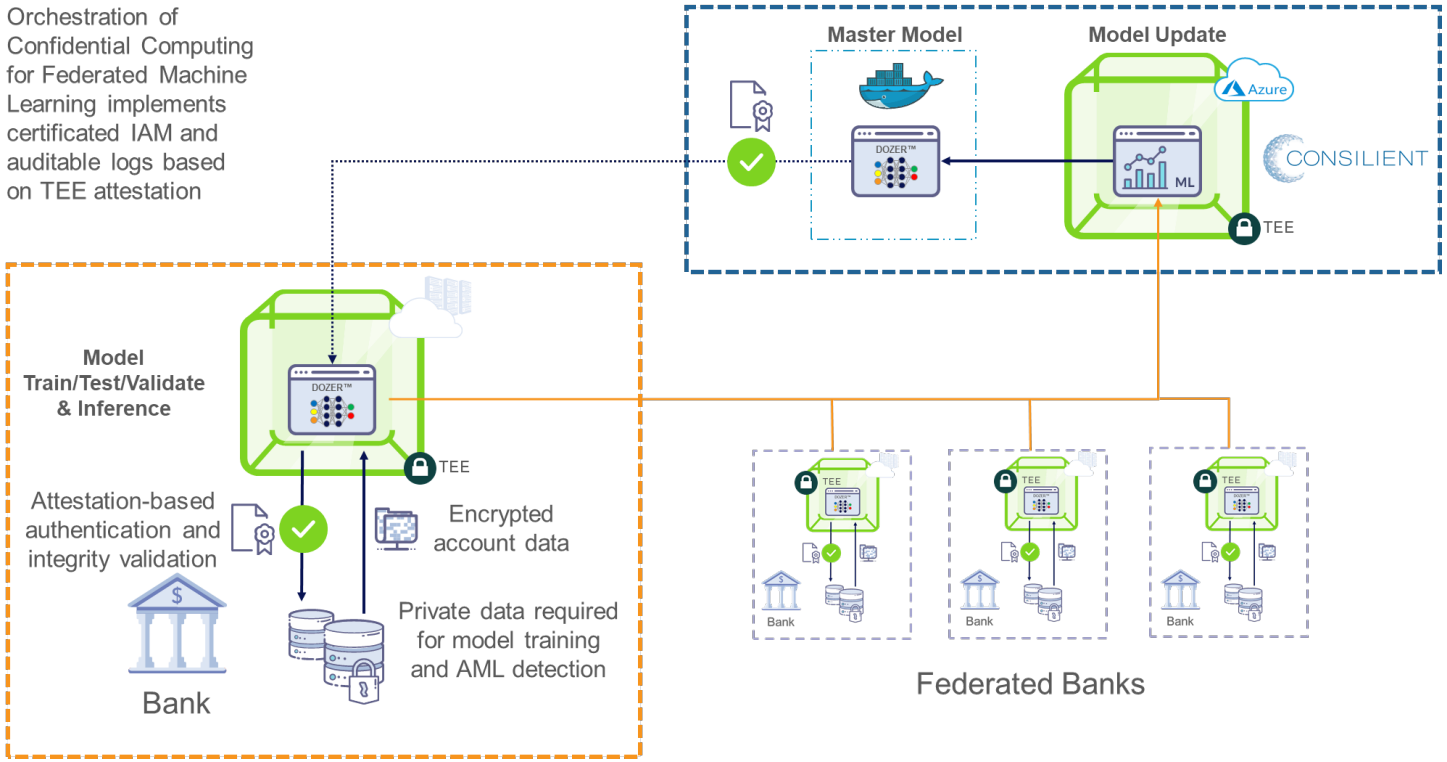
Confidential Computing in Practice



https://venturebeat.com/2021/04/09/consilient-ucsf-health-intel-deploy-confidential-computing-to-safeguard-data-in-use/

Use-Case: Consilient – Anti-Money Laundering

- Between **$800 million and $2 trillion** in illicit transactions flow through the global economy each year with **<1%** intercepted by law enforcement agencies.
- AI technology can enhance detection but requires massive amounts of heterogeneous bank data for training and testing.
- Federated Machine Learning (FML) enables distributed AI training but carries data privacy risks.
- Confidential Computing enables AI training and inference while protecting bank data in use and maintaining the integrity of the detection algorithm and the active model.

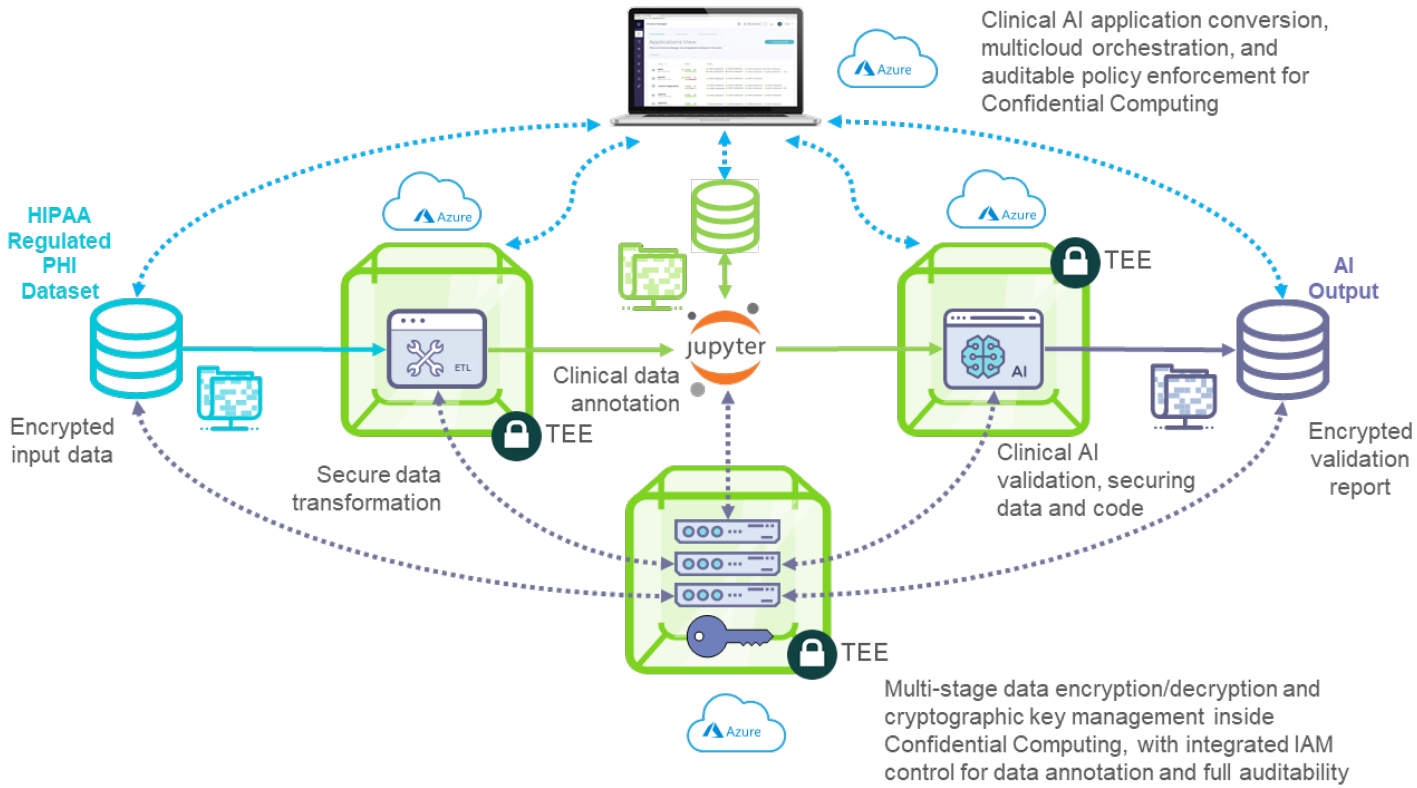


Use-Case: UCSF BeeKeeperAI™ – Clinical AI Validation

- Clinical AI validation requires access to PHI data via a protracted and costly approval process. Research often stalls.
- Confidential Computing enables protection of PHI data **and** protection of intellectual property within the algorithm code.
- With cloud scalability and auditable compliance, BeeKeeperAI™ enables rapid validation of AI to achieve US FDA approval.
- Estimated **55% - 75%** reduction in time to regulatory approval.
- Estimated cost saving of **~$2.0M** per algorithm, delivering healthcare and economic benefit to patients.

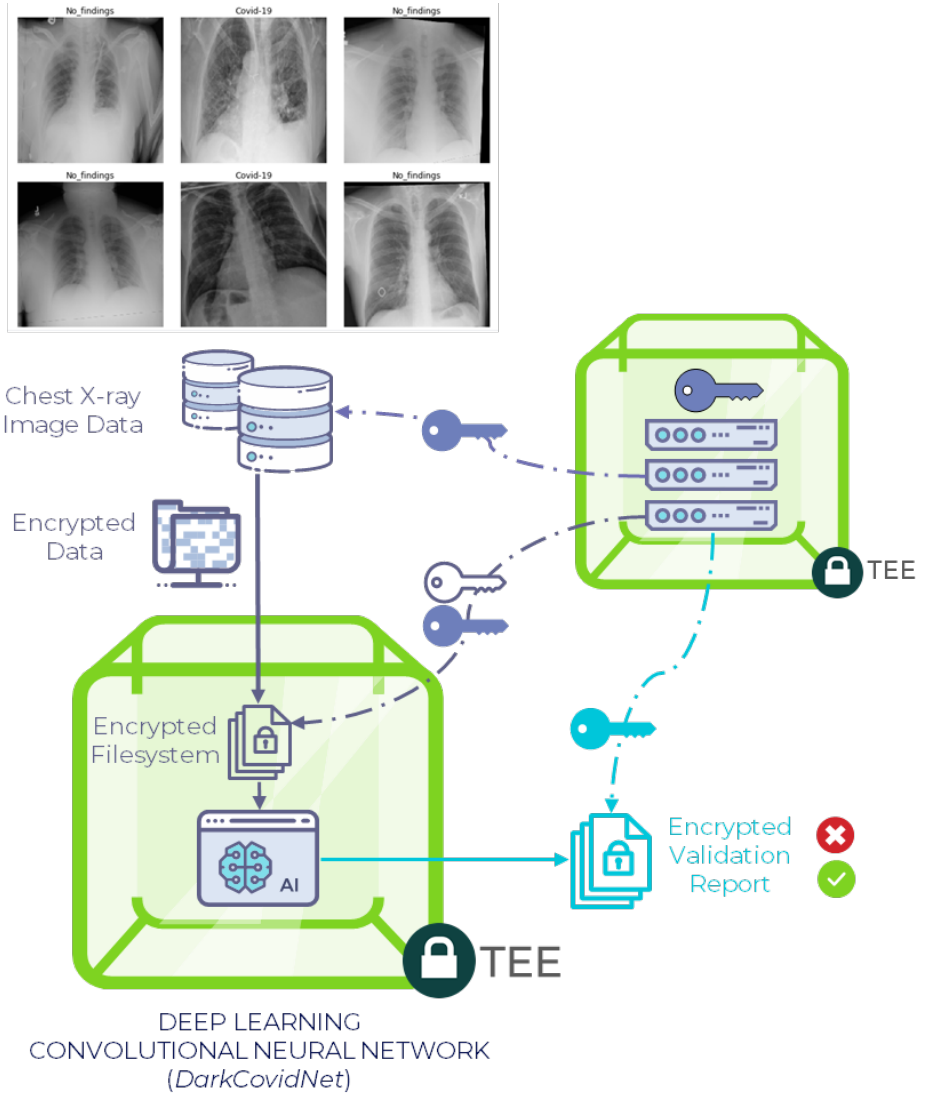
cdhi | Center for Digital Health Innovation at UCSF

BeeKeeperAI™



Use-Case Demonstration: AI Image Classification

- Confidential Computing offers rapid, scalable deployment of sensitive data and applications to provide end-to-end data security.
- The COVID-19 pandemic saw huge interest in Confidential Computing as an enabling technology for healthcare AI.
- In December 2020, *DarkCovidNet* demonstrated the convolutional neural network (CNN) protected by a TEE with equivalent functionality and comparable performance to unprotected implementations.
  - https://fortanix.com/blog/2020/12/securing-healthcare-ai-with-confidential-computing/



Demonstration

Buyers Guide/Critical Criteria

Things to look in your Confidential Computing solution:

- ✓Broad custom and off the shelf application support
- ✓Consistent/Easy to deploy on prem and in the cloud
  - ✓Cloud/hardware technology/version agnostic
  - ✓Lift and shift of apps/workloads/data
  - ✓Integrates with existing IT processes and systems
    - ✓Key management
    - ✓Containers/Kubernetes
    - ✓Management and monitoring
- ✓Ready and abstracted for the future
  - ✓New clouds/platforms
  - ✓Homomorphic encryption technologies

Learn More! Watch the Other Sessions in this Series

What is Confidential Computing and Why Should I Care?

Watch on-demand: https://youtu.be/HnLfKUI0_Y4

Confidential Computing Protecting Data in Use

Watch on-demand: https://youtu.be/7XKTmL9bHV8

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