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Pioneering Minds

EVOLVE BBMRI-ERIC

A CRYPTOGRAPHIC FRAMEWORK FOR SECURE BIOBANK DATA COLLABORATION

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WHY IS CYBERSECURITY IMPORTANT?

Most sensitive data we will ever store

Biological Identity

Patients

Data that defines people, not just systems…

Research

Regulations

It already happened

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Pfizer/BioNTech - EMA (2020)
Cyberattack on EMA stole confidential COVID-19 vaccine data. Internal research and regulatory documents later leaked online.

Moderna (2020)
State-sponsored groups targeted Moderna to steal COVID-19 vaccine data in coordinated cyber-espionage campaigns.

UC San Francsico (2020)
Paid $1.14M ransom to recover encrypted biomedical research and academic data.

HCA Healthcare (2023)
11.27M patient records exposed via a compromised external email-formatting server.

What attackers can do

Confidentiality

Steal / Expose

Sensitive data leakage

Integrity

Alter / Manipulate

Corrupted research data

Availability

Encrypt / Disrupt

Systems locked & Downtime

Trust

Extort / Damage

Reputation & Legal Impact

BIOBANKS ARE BECOMING FULLY DATA-DRIVEN

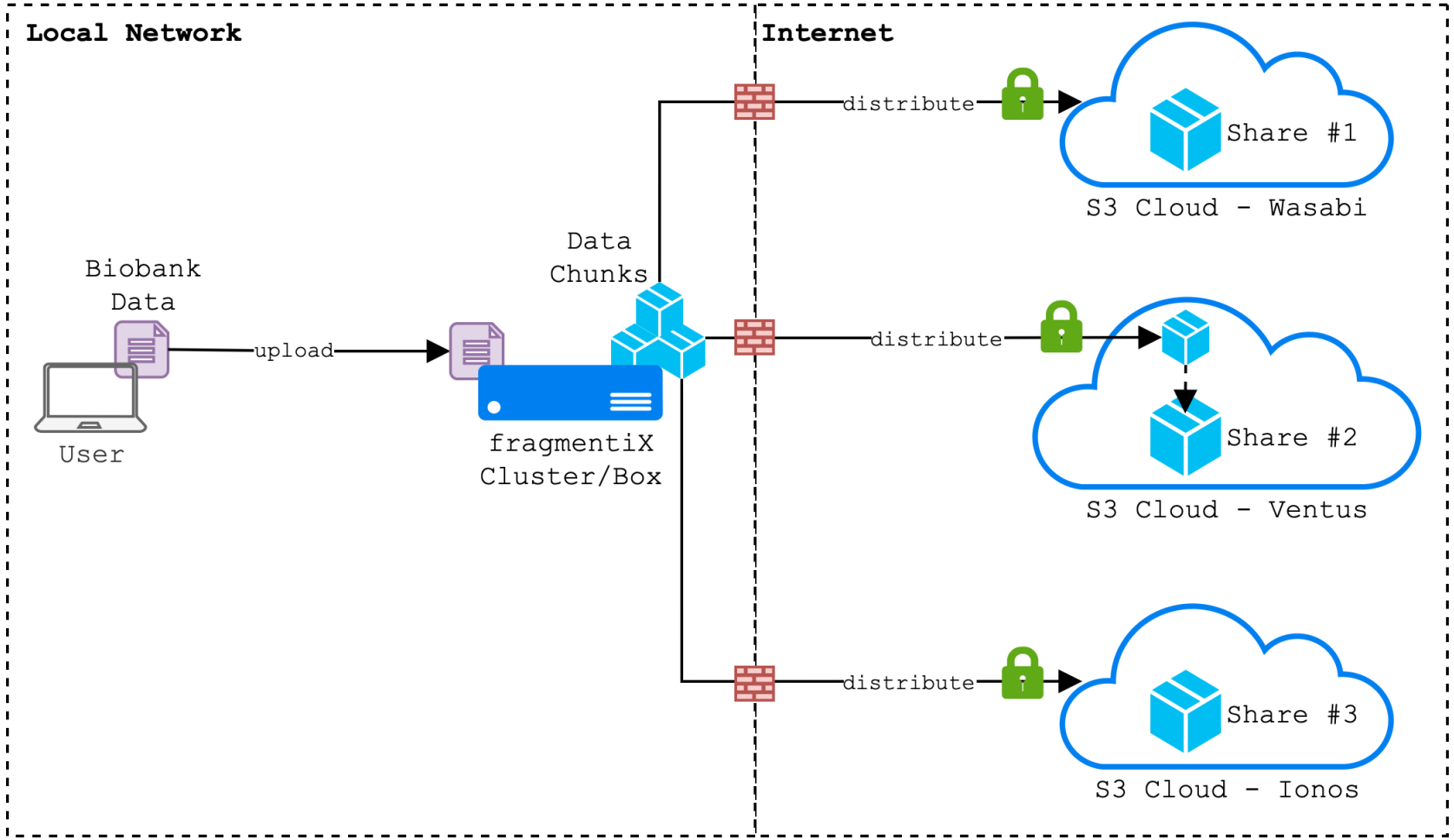
...

ARE WE READY FOR THAT?

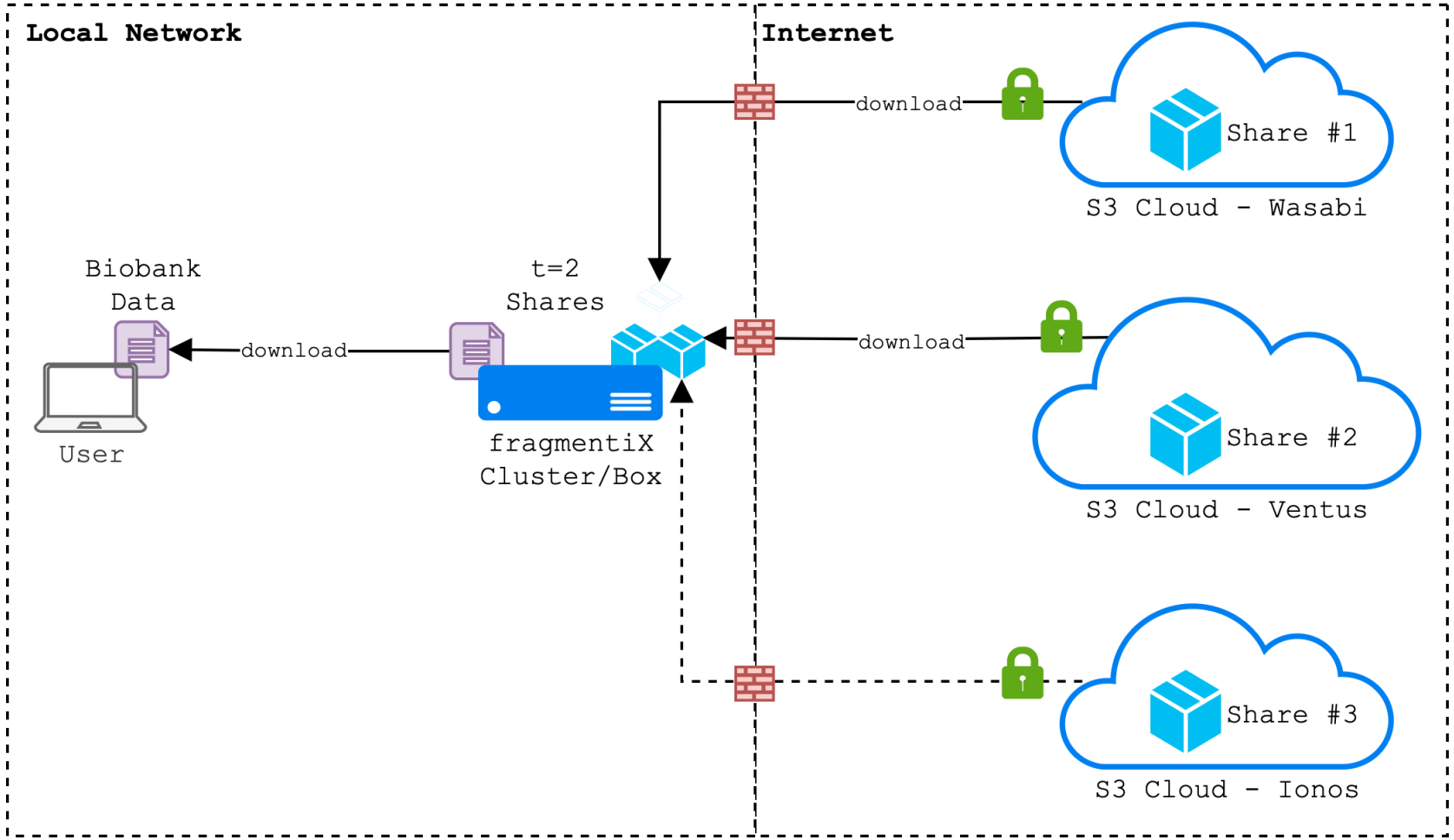
FROM CENTRALIZED RISK TO DISTRIBUTED TRUST

A multi-cloud approach using Shamir‘s secret sharing

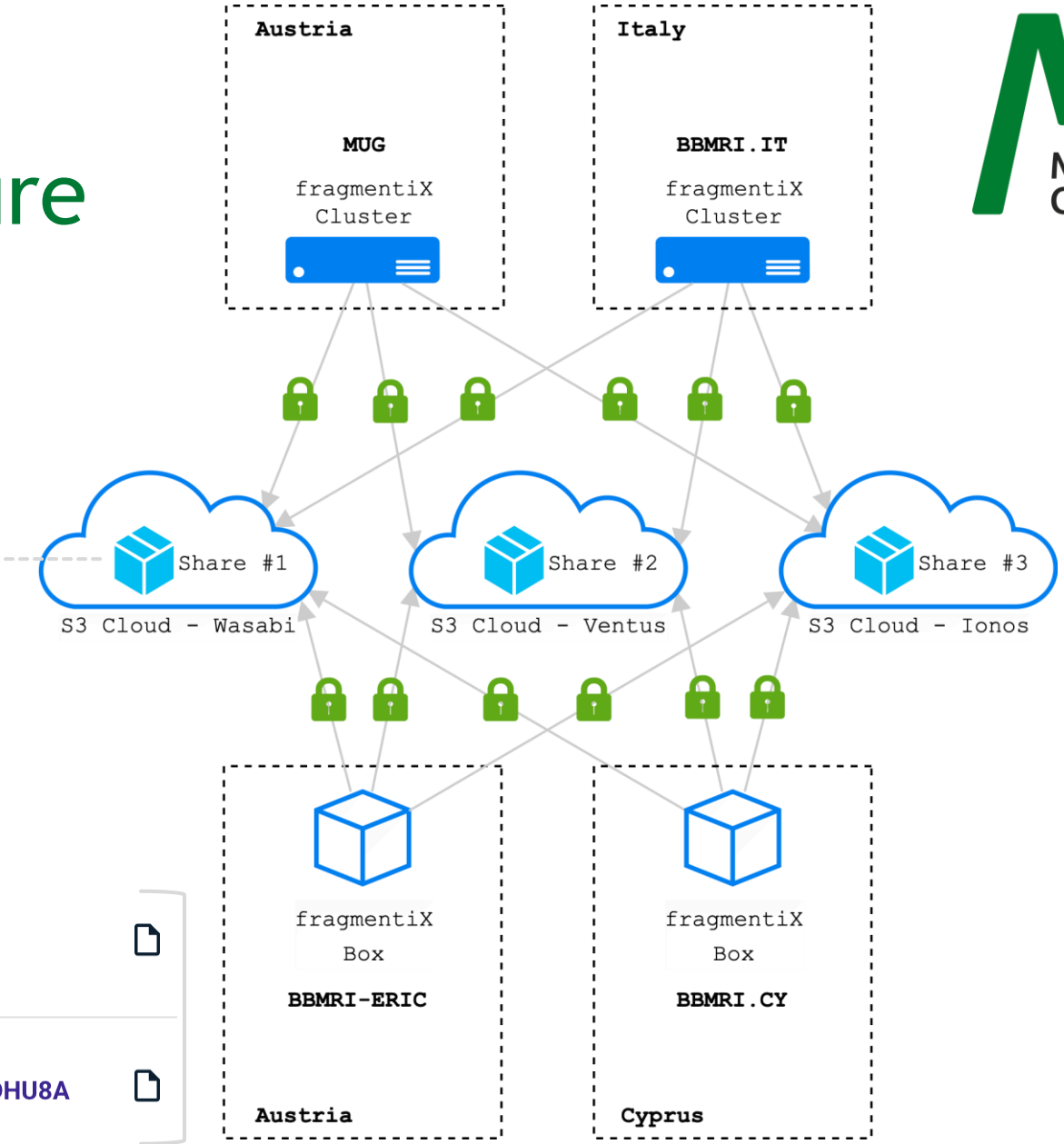
Secure data distribution



Controlled data reconstruction



Distributed multi-cloud architecture



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data-00013Rg5H_y8c7T71QN5qPhk7ZeIu0IYYMlfYXZCjlrYXPECAAAAAAADHU8A

The future of biobank security

- No “reset button”

  Biomedical data is irreversible

- Resilience by design

  Eliminating single points of failure

- Future-proof security

  Information-theoretically secure

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EVOLVE BBMRI-ERIC

We are not just protecting data,
we are protecting the trust that makes medical progress possible…

THANK YOU!

Join the conversation:

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