

Alvarium

PROJECT ALVARIUM

As a Stage 1 project in LF Edge, Project Alvarium aims to build a framework and SDK for trust fabrics that deliver data from devices to applications with measurable confidence.

See the vision at: <https://youtu.be/88KbYmlkFdw>

Project Alvarium at a Glance

- New LF project forming to focus on system-level trust and data confidence
- Differentiated in its comprehensive view and in delivering data to applications with measurable confidence
- Unifying, not reinventing trust insertion technologies
- Relevant to all markets and solution stacks
- Seeded by Dell Technologies code

Project Mission:

- Create the framework and open APIs that bind together existing open source and commercial value-add for trust insertion, develop confidence score algorithms
- Collaborate with other LF projects and industry efforts (OSS, SDO) to unify existing and emerging trust insertion technologies and refine scoring algorithms

What is a Data Confidence Fabric (DCF), or “trust fabric”?

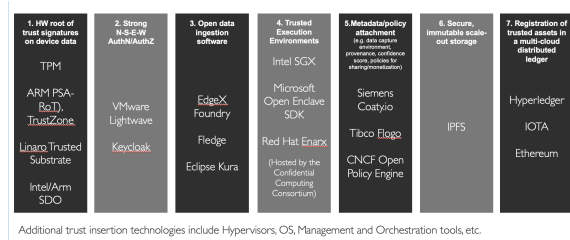
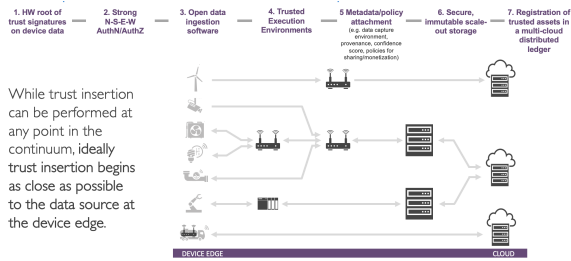
- A Data Confidence Fabric (DCF), or more generally-speaking trust fabric, is a virtual overlay that aids in the delivery of data from devices to applications with measurable trust characteristics.
- A DCF is a loosely-coupled collection of various trust insertion technologies, bound together with an open framework
 - Example technologies include tools for silicon-based Root of Trust (RoT), open authentication and data ingestion APIs, metadata handling, immutable storage and blockchain/ledger
- The Alvarium framework features open APIs and integrated algorithms to generate confidence scores for data based on the trust insertion technologies used and overall context
- There is no single DCF, rather each entity/organization can build their own fabric with preferred technologies using the Alvarium framework
 - A trust fabric built with widely trusted ingredients will naturally produce the highest data confidence scores
 - Confidence scores normalize across systems of systems as data flows through intersecting trust fabrics
- Key differentiation from other efforts focused on security, privacy and trust:
 - Holistic, system-level focus
 - Confidence scores to enable organizations to act with measured risk based on policy appropriate for the use case / context, working across heterogeneous systems of systems

Why we need to collaborate on a **global trust fabric**

- Pervasive sharing and monetization of data, resources and services across heterogeneous systems of systems spanning public and private boundaries
 - Can also include trusted sharing/exchange of data sets for training AI model
 - The common “zero trust” model isn’t scalable, access policy needs to be attached to trustworthy data
- Consolidating workloads on common infrastructure in a trusted fashion
 - Enable sharing of data/services based on policy while protecting privacy and IP
 - Address common debates on data ownership
- Meeting compliance requirements (e.g. GDPR) at scale
 - Enables organizations to trigger deletion of distributed data in place when a user requests to revoke privacy consent

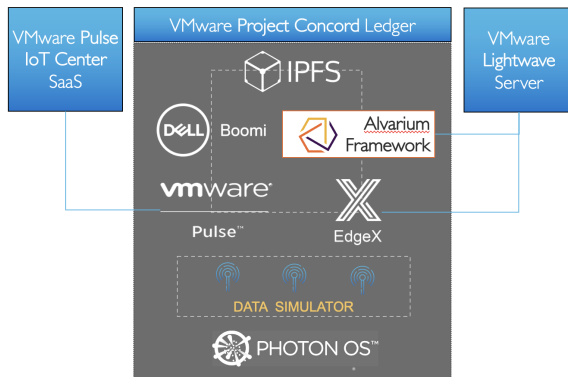
Example end-to-end trust insertion points

Example OSS trust insertion technologies



Initial DCF prototype

- Dell Technologies' initial Data Confidence Fabric (DCF) prototype (completed in August 2019) demonstrated a trust fabric comprised of a mix of open source and commercial technologies
- Prototype was deployed entirely on one edge system to locate policy insertion for data monetization/compliance as close as possible to the data source
- **Alvarium framework unifies the various loosely-coupled trust insertion elements**
- **Solution could just as well be deployed in a distributed fashion**
- Next steps in prototyping – demonstrating technology swapability, for example exchanging Project Concord ledger for Hyperledger or IOTA
- Dell will contribute the Alvarium framework code to seed the project



Example Confidence Scoring

- Scoring creates a weighted confidence depending on trust insertion technologies implemented in a given trust fabric
- Dell's initial DCF prototype leveraged a simple linear scale for simplicity
- Scoring algorithms will require industry collaboration to develop
- Initially via OSS but may require some standards work
- Likely to make sense for weighted scoring, some factors that zero out confidence

