Figure 1: logo

On 5 May 2020, the Linux Foundation announced a new addition to its roster of global open source ecosystem projects: the **Trust over IP Foundation**.

The mission of this new Foundation is to simplify and standardize how trust is established online so that everyone can feel safe, secure, and private in all of our digital interactions—whether between individuals, businesses, governments, or any "thing" on the Internet of Things.

In this white paper, we will cover:

- Digital Trust Challenge
  - Trust in the Pre-Internet Era: the simple, global mechanisms we evolved to establish trust in relationships before we ever went online.
  - The Internet Era and the "Trust Gap": What happened when we moved online and why we ended out with such a large "trust gap" vs. real-world trust.
  - The New Era of Digital Trust: How we can finally bridge this trust gap with open standard digital credentials and governance frameworks.
  - The Trust over IP Stack: How this four-layer, dual-stack architecture has the potential to do for the peer-to-peer exchange of trustworthy digital credentials what the TCP/IP stack did for the peer-to-peer exchange of data packets.
  - The Role of the Trust over IP Foundation: How this new organization will provide a global forum for collaboration on developing, hardening, testing, and promoting the Trust over IP stack.
- Trust over IP (ToIP) Stack: The starting definition of the ToIP stack was published as Hyperledger Aries RFC 0289.
- Foundation Role and Process

Trust is defined as to have confidence, faith or hope in a relationship with someone or something.

Trust is both an emotional and logical act. Emotionally, it is where you expose your vulnerabilities to people, but believing they will not take advantage of your openness. Effectively, trust is a feeling. Emotions associated with trust include

companionship, friendship, love, agreement, relaxation, comfort.

When considering collaborative relationships, the four most common elements needed to develop trust are:

- competence
- reliability
- integrity
- communication

Without any one of these, it can be difficult to create the trust needed for a sustainable and successful interactions between the parties of a relationship.

Examples of In-Person or "Human Trust" include:

- believing that the sun will rise in the morning
- confidence that the school bus driver will safely transport your child to school
- comfort in the experience and capabilities of your doctor
- relying on the bank to carry-out your financial transactions
- respecting your employers ability and policies to protect your personal data

The complexities of our daily lifestyles have moved beyond In-Person Trust to include the challenges of online interactions. Yet the same elements of trust must be considered regardless of the mode of interaction (physical, online).

In the era before digital networks—when relationships and business interactions were all managed face-to-face—we had evolved a simple, universal, decentralized mechanism for achieving trust. We used credentials of all kinds.

creds

Note that by "credentials" we don't just mean the pieces of paper or plastic that you carry around in your wallet to prove your identity, for example, driving licenses, government IDs, employment cards, credit cards, and so on. We mean any document of any size that enables you—or your organization—to prove something about you that enables the establishment of trust. For example, this could include:

- A birth certificate issued by a hospital or vital statistics agency that proves when and where you were born and who were your parents.
- A business registration or license of any kind that proves you are authorized to conduct a specific type of business.
- A diploma issued by a university that proves you have an educational degree.
- A passport issued by a government of a country that proves you are a citizen.
- An official pilot's license that proves you can fly a plane.
- A utility bill that proves you are a registered customer of the utility.

- A power of attorney issued by the appropriate authority within a jurisdiction that proves that you can legally perform certain actions on behalf of another person.

The reason credentials have evolved as a universal mechanism for establishing real-world trust is the fundamental "trust triangle" illustrated below.

ctt

No matter what type of credential, the triangle involves the same three primary roles:

1. **Issuers** are the source of credentials—every credential has an issuer. Most are organizations such as government agencies (passports), financial institutions (credit cards), universities (degrees), corporations (employment IDs), churches (awards), etc. However individuals can also be issuers.
2. **Holders** request credentials from issuers, hold them in their wallets or filing cabinets, and present them when requested by verifiers (and approved by the holder). Although we most commonly think of individuals as holders, holders can also be organizations, or even things (such as the registration for a car).
3. **Verifiers** can be anyone seeking trust assurance of some kind about the holder of a credential. Verifiers request the credentials they need and then follow their own policy to verify their authenticity and validity. For example, a TSA agent at an airport will look for specific features of a passport or driver's license to see if it is valid, then check to ensure it is not expired.

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The ToIP Foundation aims to produce several publicly accessible artifacts. Each working group within the Foundation will determine the type and quantity of work products to be produced.

diagram

Templates

To help the community quickly leverage lessons learned by others that have established digital trust solutions, the Foundation will produce reusable documents that provide proven patterns that can be used to bootstrap new activities in a consistent manner.

Specifications

A specification, in the context of ToIP, refers to a set of documents that state explicitly or in detail the requirements to be satisfied by a design. Often a specification may mature into a technical standard. All standards are specifications but not all specifications are standards.

TIP

A ToIP Interoperability Profile (TIP) represents a specific combination of technologies that span each layer of the ToIP Technical Stack. TIPs can be designed, refined and supported by interoperable vendors. A TIP will often be applicable to specific design principles and use cases. Click here for more details.

Recommendations

The ToIP Foundation, as authoritative body, can publicly suggest or propose a best course of action referred to as a recommendation. There are three (3) recommendation types: Best Practices, Guidelines and Glossaries.

Best Practice

A best practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one's disposal to ensure success. Unlike standards that are long on the making, a best practice can be used to maintain quality and can be based on self-assessment or benchmarking. Best practices are important for processes that you need to work correctly. They are simply the best way to do things and have been worked out through trial and error, and are found to be the most sensible way to proceed.

Guideline

A guideline is a statement by which to determine a course of action. A guideline aims to streamline particular processes according to a set routine or sound practice.

Glossary

A glossary, also known as a vocabulary or clavis, is an alphabetical list of terms in a particular domain of knowledge with the definitions for those terms.

White Papers

A white paper is a public access authoritative report or guide that informs readers concisely about a complex issue and presents the issuing body's philosophy on the matter. It is meant to help readers understand an issue, solve a problem, or make a decision.

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Frequently asked question?

Answer

Frequently asked question?

Answer

ToIP Foundation

Contact Steering Committee

Email xxxxxxxxxxxxx

Contact Authors

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