

STANDARDISATION NEEDS ON REFERENCE ARCHITECTURE, TAXONOMY, AND ONTOLOGY

CRYPTO4ALL



Blockchain & Distributed Ledger Technologies

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ROLE & CHALLENGE OF ISO TC / TC307 – BLOCKCHAIN & DISTRIBUTED LEDGER TECHNOLOGIES

- ✓ Convince all of solution providers, foundations/consortia and government to work in consensus to not stifle innovation
- ✓ Educate stakeholders about the technology benefits, specificities and risks as well as functionally than technically through terminology, use case, smart contract, architecture and so on
- ✓ Make standards to promote best practice, increase efficiency, interoperability & quality

TAXONOMY & ONTOLOGY PURPOSE

- ❖ Taxonomy comes from the term « taxon » which means a group of organism. In our case it's consisting to study of naming, describing and classifying an agnostic blockchain & distributed ledger system.
- ❖ Ontology in sense of computer science is more a model to describe in our case a blockchain & distributed ledger system as a set of types, properties, and relationship types.

TAXONOMY & ONTOLOGY PURPOSE

Consensus		Transaction Capabilities		Native Currency/Tokenisation		Extensibility		Security and Privacy		Codebase		Identity Management		Charging and Rewarding System		
Consensus Network Topology	Decentralised	Data Structure in Blockheader	Binary Merkle Tree	Native Asset	None	Interoperability	Implicit Interoperability	Data Encryption	SHA-2.	Coding Language	Single Languages	Access Layer and Control Layer	Public Blockchain	Reward System	Lump-sum Reward	
	Hierarchical		Patricia Merkle Tree		Own Convertible Currency		Explicit Interoperability		SK-SNARKS		Multiple Languages		Permissioned Public Blockchain		Block + Security Reward	
	Centralised		Convertible Multiple Assets		No Interoperability											
Consensus Immutability and Failure Tolerance	PoW	Transaction Model	UTXO	Asset Supply Management	Limited Deterministic	Intraoperability	Implicit Intraoperability	Data Privacy	Built-in data privacy	Code Licence	Open Source	Identity Layer	KYC/AML	Fee System	Mandatory Fees	
	PoS		Traditional Ledger		Unlimited Deterministic		Explicit Interoperability		Add-on data privacy		Closed Source		Anonymous		No Fees	
	PoA		Pre-Mined		No Interoperability										Optional Fees	
	PoC & PoStor Hybrid		Tokenisation		No tokenisation present										Variable Fees	
Gossiping	Local	Server Storage	Full Nodes	Tokenisation	Tokenisation + 3rd party add-ons	Governance	Open-source Community Mode			Software Architecture	Monolithic Design				Fixed Fees	
	Global		Thin Nodes Capabilities		Tokenisation		Technical Mode				Polythetic Design					
Consensus Agreement	Synchronous	Block Storage	Transactions			Script Language	Turing Complete									
	Asynchronous		User Balance				Generic Non-Turing Complete									
Finality	Deterministic	Limits to scalability	Number of nodes													
	Non Deterministic															
			Number of transactions													
			Number of users													
			Block Confirmation Time													

FIGURE 28: Blockchain Ontology Matrix

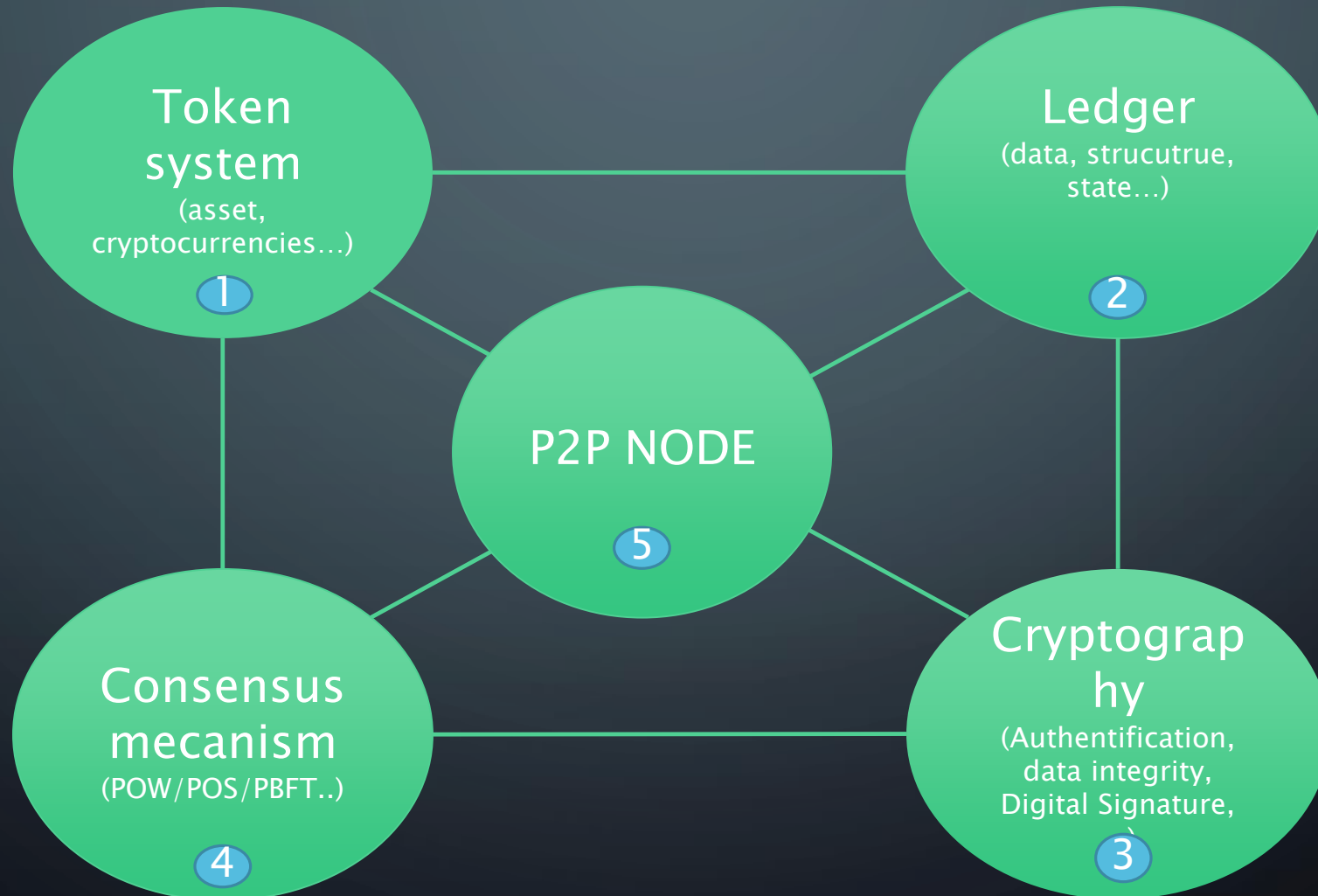
Ontology of Blockchain Technologies

REFERENCE ARCHITECTURE OBJECTIVE

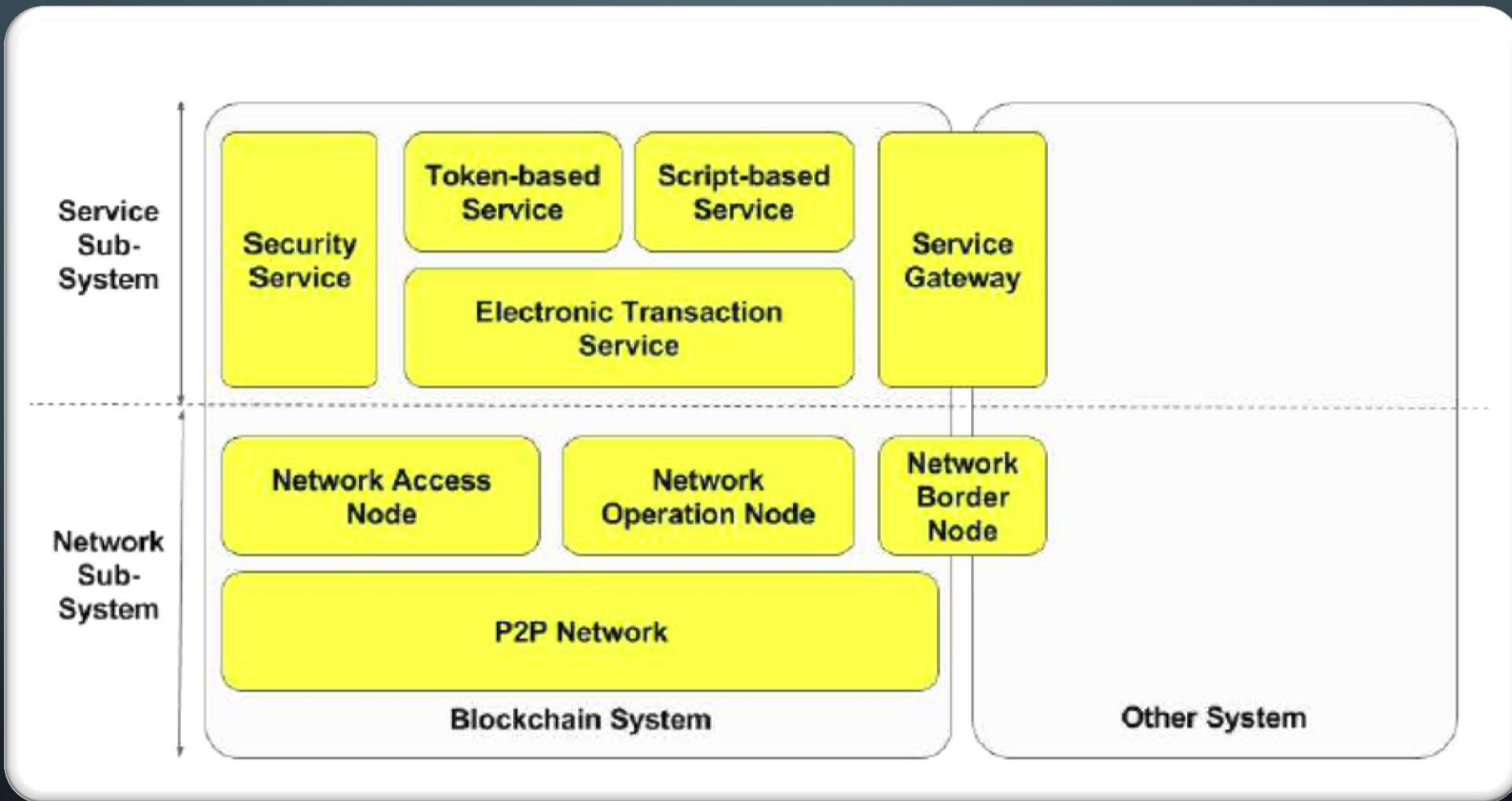
- ❖ A **system architecture** or **systems architecture** is the conceptual model that defines the structure, behavior, and more views of a system.^[1] (source Wikipedia).
- ❖ In our case we will try to identify all architecture elements and components that allow us to represent as detail as possible a Blockchain & distributed ledger system in a way that supports reasoning about the structures, behaviors & management of the system.

REFERENCE ARCHITECTURE OBJECTIVE

OVERVIEW OF THE MAIN BLOCKCHAIN & DLT FUNCTIONS



REFERENCE ARCHITECTURE OBJECTIVE



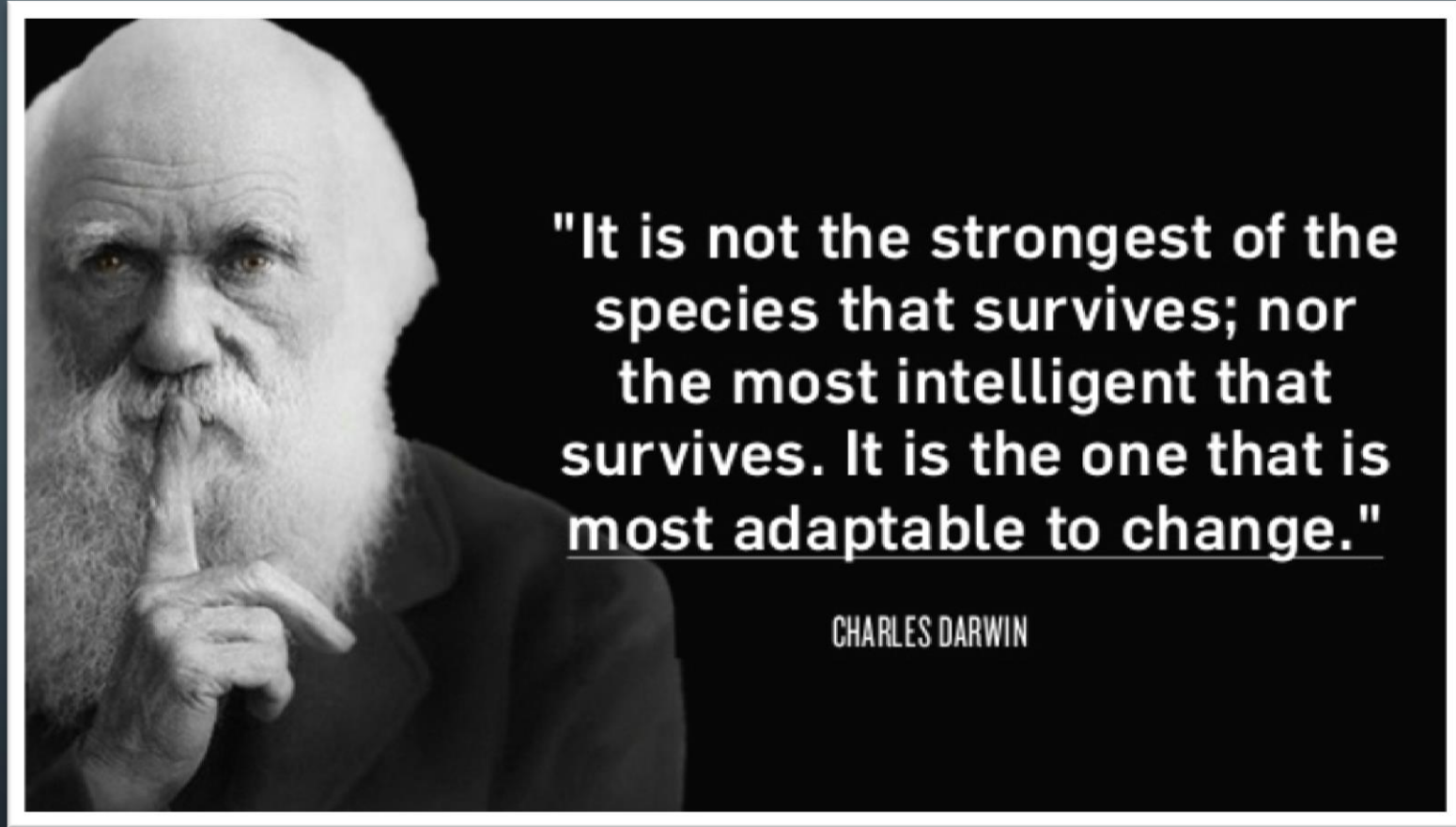
Overall Architecture Elements of a Blockchain System

Open reflections

- ❖ What are the main components of a Distributed Ledger System?
 - Access rights
 - Consensus rules
 - Auditability
 - Interoperability (Asset, tokens, smart contracts...)

- ❖ (2) Data management and storage in a Distributed Ledger System:
 - Who owns the nodes that mine the blocks and how are transactions being validated?
 - Where do we store the data ?
 - How does the data stored within a blockchain interact with the data stored outside?
 - What are the constraints imposed by data privacy regulation (for example GDPR in Europe) with regards to the storage of personal data and the immutability of the blockchain?

THANK YOU VERY MUCH FOR YOU
ATTENTION



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