

SG11 Workshop “Control plane of IMT-2020 and emerging networks. Current issues and the way forward”
(Geneva, Switzerland, 15 November 2017)

ITU-T activities on Blockchain

Gyu Myoung Lee

LJMU, UK/KAIST, Korea

ITU-T Chairman of Focus Group on Data Processing and Management

ITU-T WP3/13 Co-chair, Q16/13 and Q4/20 Rapporteur

gmlee@kaist.ac.kr



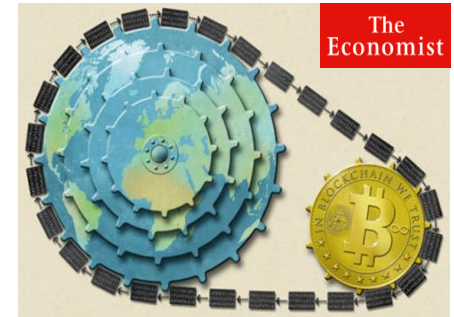
Contents

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 - Features and characteristics of Blockchain
- ITU-T activates for Blockchain Standardization
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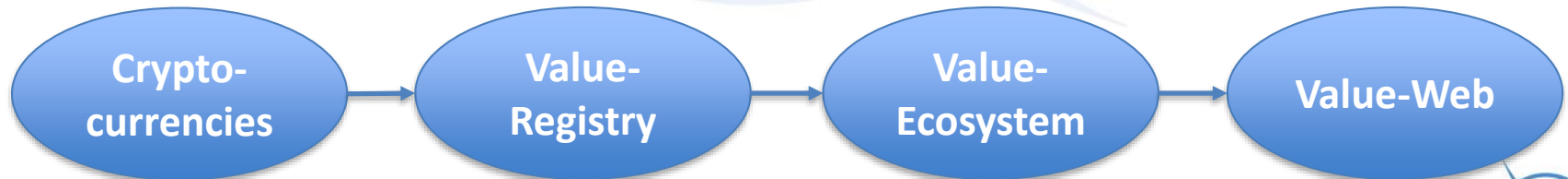
A New Paradigm – Blockchain

“It is a machine for creating trust.”

(Source: The Economist)



- The currency in the Internet is **data**.
- Revolutionizes how transactions are recorded
 - a **decentralized digital ledger** that records transactions
 - builds **trust** with **accountability** and **transparency**



Blockchain

- **Blockchain**

- a database that maintains a continuously growing set of data records.
- **Decentralized approach** - there is no master computer holding the entire chain.
 - Peer-to-peer messaging
 - Distributed file sharing
 - Autonomous device coordination

- **Two types of elements**

- **Transactions** are the actions created by the participants in the system.
- **Blocks** record these transactions and make sure they are in the correct sequence and have not been tampered with.
- Blocks also record a time stamp when the transactions were added.

Key Benefits

- **Build trust**
 - enables devices to participate in transactions as a trusted party
- **Reduce costs**
 - remove the ‘middle man’ from the process.
- **Accelerate transactions**
 - reduce time needed for completing legal or contractual commitments.

Related ITU-T Activities

- Focus Groups
 - FG-DPM (Data Processing & Management)
 - FG-DLT (Distributed Ledger Technology)
 - FG-DFC (Digital Currency)
- SG13 – Future Networks (& Cloud)
- SG17 – Security
- SG20 – IoT, Smart Cities & Communities

FG-DPM

- **Parent study group:** ITU-T SG20 (IoT and SC&C)
- **Established:** ITU-T SG20 meeting (Dubai, 22 March 2017) following the 1st Forum on Data Management: Transforming Data Into Value www.itu.int/en/ITU-T/Workshops-and-Seminars/iot/201703
- **Overall objectives:**
 - promote the establishment of trust-based data management frameworks for IoT and SC&C
 - investigate existing and emerging technologies
 - Identify and address standardization gaps and challenges
- **Meetings**
 - 1st meeting: 17-19 July 2017 (Geneva)
 - 2nd meeting: 20-25 October 2017 (Geneva)
 - 3rd meeting: 19-23 February 2018 (Brussels) - TBC



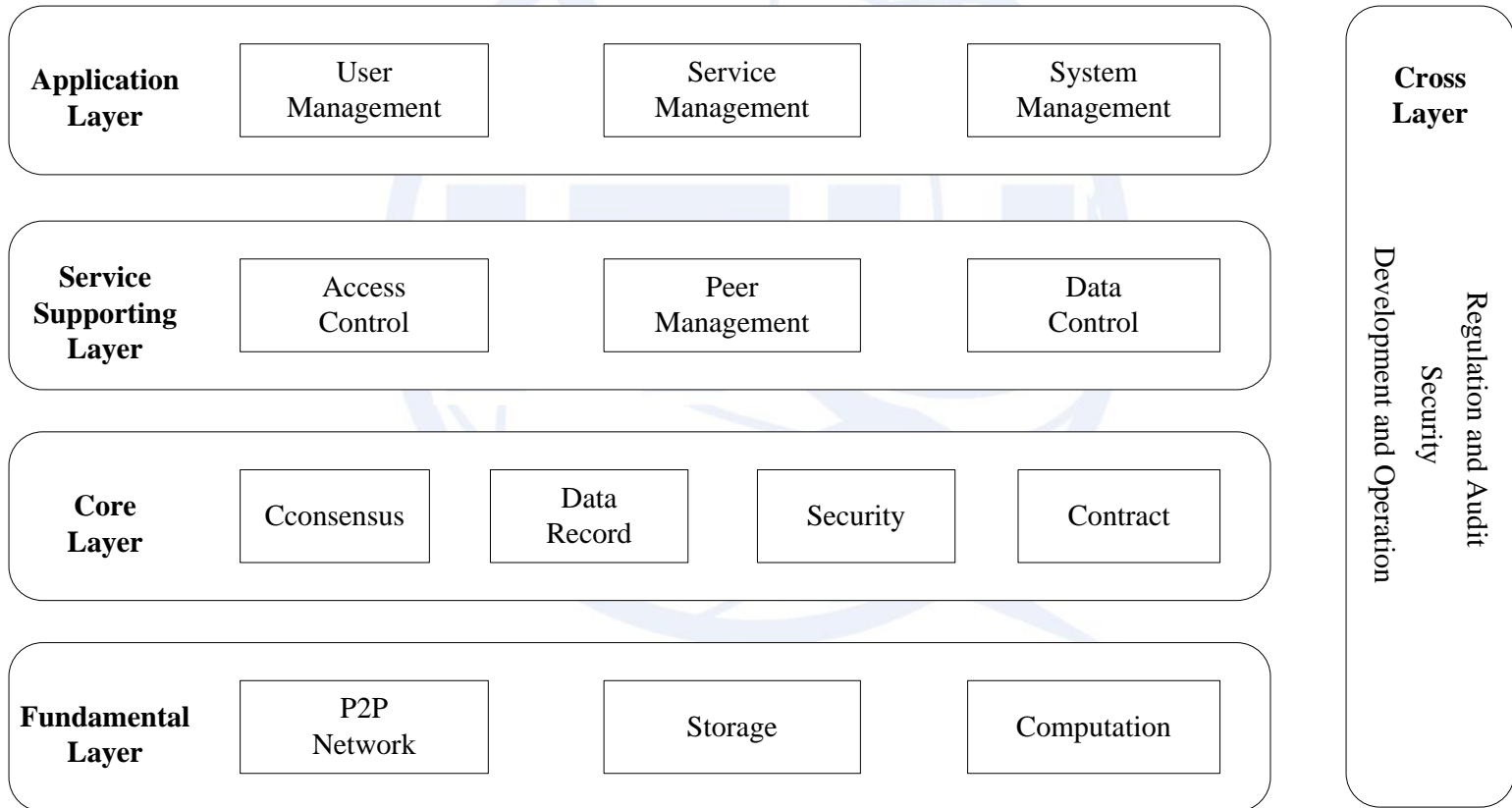
Deliverables on Blockchain in FG-DPM

- **WG3: Data sharing, Interoperability and Blockchain**

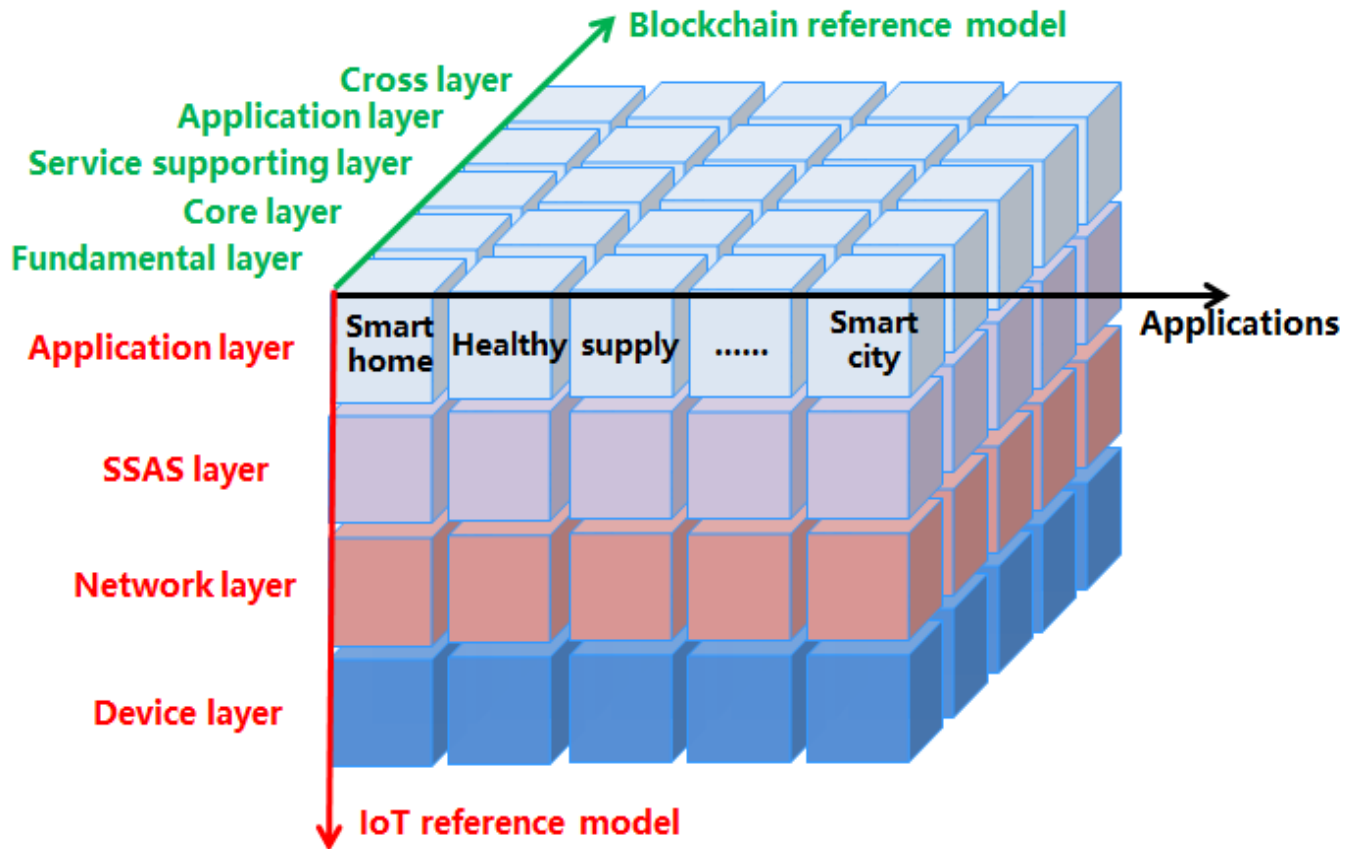
D3.5 Overview of IoT and Blockchain	<ul style="list-style-type: none">• Provide blockchain overview including basic concepts, key characteristics, various models• Analyze blockchain as a decentralized database solution• Analyze key benefits of using blockchain for IoT in terms of accelerating transaction, reducing costs and building trust• Specify roles of blockchain technique in DPM for IoT and SC&C applications
D3.6 Blockchain-based Data Exchange and Sharing Technology	<ul style="list-style-type: none">• Identify roles and considerations of blockchain in data exchange and sharing• Identify challenges for blockchain-based data exchange and sharing• Present blockchain operations to support resilience, sharing, and auditable protection of IoT data• Demonstrate how blockchain can change the future of IoT in relation to device identity and data integrity
D3.7 Using blockchain to improve data management	<ul style="list-style-type: none">• Identify roles and considerations of blockchain in data management• Identify challenges of blockchain technique to improve data management• Provide detailed operations of blockchain in data management perspectives• Analyze blockchain in the public sector's data management of data as a public good<ul style="list-style-type: none">✓ Case study – blockchain in smart cities• Analyze blockchain in the industry's data management of data as a source of competitive advantage<ul style="list-style-type: none">✓ Case study – blockchain in industrial applications



A common reference model of the Blockchain

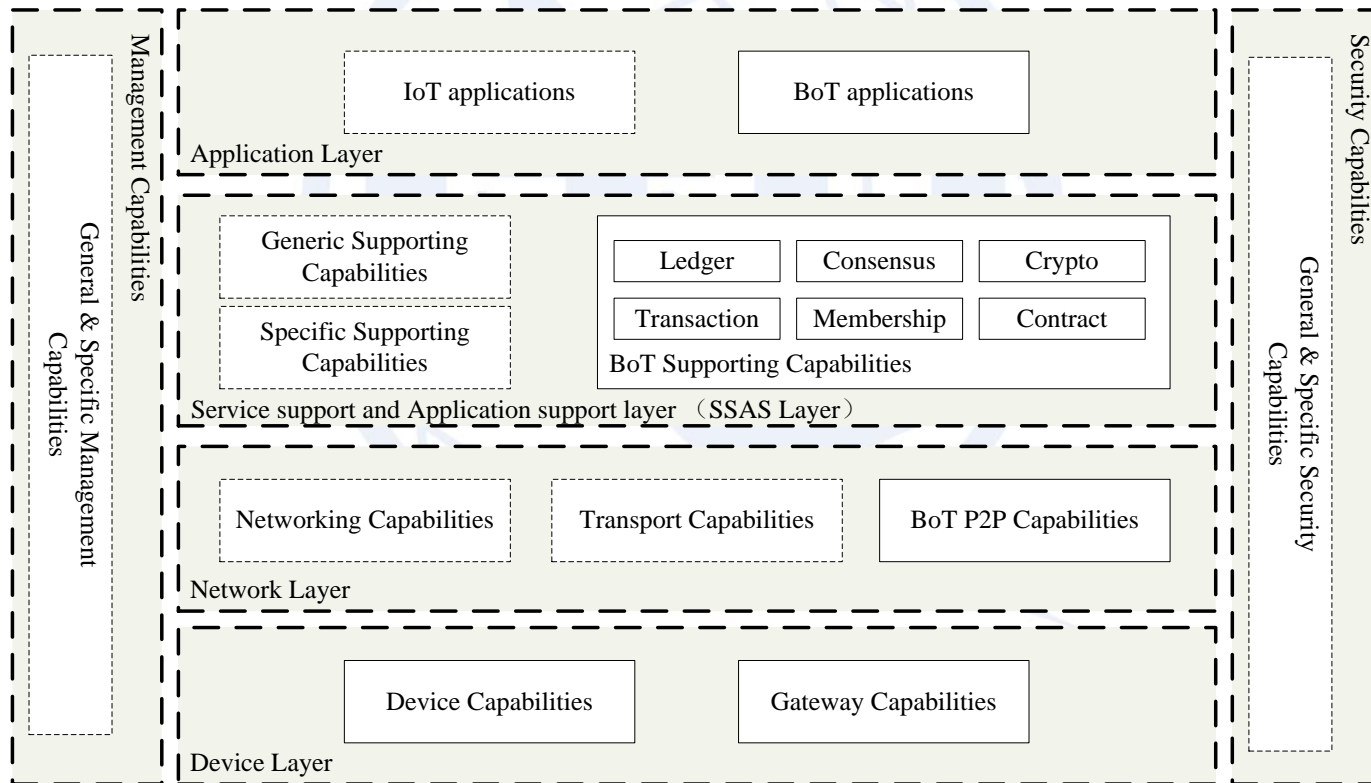


Convergence of the Blockchain and IoT/SC&C



SG20 – Y.IoT-BoT-fw

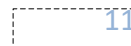
- Blockchain of Things as decentralized service platform



Legends:



Capabilities involved in BoT

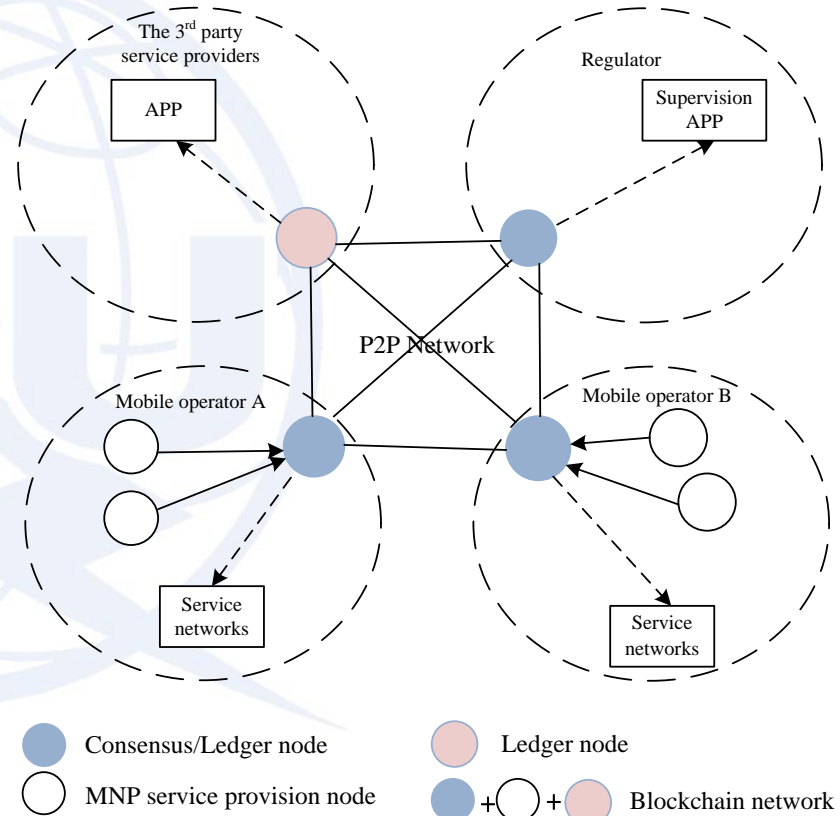


11 Typical IoT Capabilities

SG13 – Y.NGNe-BC-reqts

- **Blockchain in NGNe**

- Scenarios and use cases of blockchain in the next generation network evolution
- Characteristics and high-level requirements of the blockchain in the next generation network evolution based on the scenarios and use cases
- General framework and capability requirements of the blockchain in the next generation network evolution



SG13-C361, November 2017

SG17 – Q14/17

- **A new Question Q14/17 – “Security aspects for Distributed Ledger Technologies”**
 - X.sradlt, Security architecture for Distributed Ledger Technology
 - X.strdlt, Security threats and requirements for digital payment services based on distributed ledger technology
 - X.sct-dlt, Security capabilities and threats of Distributed Ledger Technology
 - X.ss-dlt, Security Services based on Distributed Ledger Technology
 - X.dltsec, Privacy and security considerations for using DLT data in Identity Management
 - X.sadlt, Security assurance for Distributed Ledger Technology
 - X.stov, Security threats to online voting using distributed ledger technology

Challenges

- Scalability
- Processing power and time
- Storage
- Privacy and security
- Sharing economy

Considerations for Standardization

- From networking and services perspectives
 - Identity management and related protocols
 - Secure network control plane
 - Networked collaboration with P2P
 - Network scalability
 - Decentralizing Trusted computing
 - Integrated approaches with multiple standards
 - Various applications using Blockchain (Finance, IoT, Security, Reputation System, Public service)

Conclusion

- **Trust** is the **oxygen**
- **data** is safe and it is properly treated



Internet of Value



The world's most valuable resource is no longer oil, but data

The data economy demands a new approach to antitrust rules



May 2017

