ETSI GR PDL 018 V0.0.1 (2022-07)

Redactable Distribued Ledgers

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**Group Report**

Reference

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# Foreword

This Group Report (GR) has been produced by ETSI Industry Specification Group (ISG) Permissioned Distributed Ledger (PDL).

# Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](https://portal.etsi.org/Services/editHelp!/Howtostart/ETSIDraftingRules.aspx) (Verbal forms for the expression of provisions).

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# 1 Scope

This document will describe the definition of redactable distributed ledgers, presents use cases where redactable distributed ledgers are useful, and assesses existing solutions of redactable distributed ledgers. This document also discusses potential standardization areas for enabling, managing, and using redactable distributed ledgers.

# 2 References

## 2.1 Normative references

Normative references are not applicable in the present document.

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] D. Zhang, J. Le, X. Lei, T. Xiang, and X. Liao, “Exploring the Redaction Mechanisms of Mutable Blockchains: A Comprehensive Survey,” *International Journal of Intelligent Systems*, vol. 36, no. 9, 2021, pp. 5051-5084.

[i.2] G. Ateniese, B. Magri, D. Venturi, and E. Andrade, “Redactable Blockchain – or – Rewriting History in Bitcoin and Friends,” 2017 IEEE European Symposium on Security and Privacy (EuroS&P), 2017, pp. 111-126, doi: 10.1109/EuroSP.2017.37.

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the following terms apply:

**Chameleon Hash:** tbd

**Redaction:** tbd

**Redaction operation:** tbd

**Redactable distributed ledger:** tbd

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CH Chameleon Hash

ETSI European Telecommunications Standards Institute

EU European Union

GDPR General Data Protection Regulation

PDL Permissioned Distributed Ledger

RDL Redactable Distributed Ledger

# 4 Introduction to Redactable Distributed Ledger

## 4.1 Introduction

## 4.2 Issues with Immutable Ledgers

**Editor’s Note:** To describe issues from immutability and motiations for “redactable distributed ledger”



Figure 4.1-1: Potential Issues and Limitations from Immutable Blockchain

## 4.3 Redaction Operations

**Editor’s Note:** To discuss possible operations to redact/change/modify distributed ledgers

# 5 Use Cases for Redactable Distributed Ledgers

## 5.1 Introduction

## 5.2 Self-Sovereign Identity (SSI)

## 5.3 Metaverse

Editor’s Note: Need to well define “Metaverse”. May consider “immesive experience” or other terms/scenarios.

## 5.4 Wireless and Mobile Networks

# 6 Existing Solutions of Redactable Distributed Ledger

## 6.1 Introduction

## 6.2 Chameleon Hash (CH)

## 6.3 CH-based Redactable Blockchain

### 6.3.1 Blockchain Redaction Process

### 6.3.2 Blockchain Redaction Management

## 6.4 Policy-based Redactable Blockchain

## 6.5 Redaction Using New Block Structures

## 6.6 Comparisons among Existing Redactable Blockchain Schemes

# 7 Potential Issues with Redactable Distributed Ledger

# 8 Conclusions and Next Steps

Editor’s Note: Provide “recommendations” for next steps.

# History

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