

# ISO 23257:2022-02 (E)

## Blockchain and distributed ledger technologies - Reference architecture

---

<b>Contents</b>		<b>Page</b>
<b>Foreword</b>		<b>v</b>
<b>Introduction</b>		<b>vi</b>
<b>1</b>	<b>Scope</b>	<b>1</b>
<b>2</b>	<b>Normative references</b>	<b>1</b>
<b>3</b>	<b>Terms and definitions</b>	<b>1</b>
<b>4</b>	<b>Symbols and abbreviated terms</b>	<b>4</b>
<b>5</b>	<b>Concepts</b>	<b>5</b>
5.1	DLT and blockchain systems	5
5.1.1	General	5
5.1.2	Blockchain DLT and non-blockchain DLT	6
5.2	Networking and Communications	6
5.3	DLT platform	7
5.4	DLT system interfaces	7
5.5	Consensus	8
5.6	Events	10
5.7	Integrity of ledger content	10
5.8	Integrity and ledger management	11
5.9	Subchains and sidechains	12
5.10	DLT Applications	12
5.11	DLT solutions	12
5.12	Smart contracts	13
5.12.1	General	13
5.12.2	Smart contract execution on dedicated peers	14
5.12.3	Smart contract execution on arbitrary peers	14
5.13	Transactions and how they work	14
5.14	Tokens, virtual and cryptocurrencies, coins, and associated concepts	15
<b>6</b>	<b>Cross-cutting aspects</b>	<b>16</b>
6.1	General	16
6.2	Security	16
6.3	Identity	17
6.4	Privacy	17
6.4.1	General	17
6.4.2	On-ledger PII storage	18
6.4.3	Off-ledger PII storage	19
6.5	DLT Governance	19
6.6	Management	20
6.7	Interoperability	21
6.8	Data flow	24
<b>7</b>	<b>Types of DLT systems</b>	<b>25</b>
<b>8</b>	<b>Architectural considerations for DLT Systems</b>	<b>26</b>
8.1	Characteristics and relationships	26
8.2	Ledger technology	27
8.3	Ledger storage architecture	27
8.4	Ledger control architecture	27
8.5	Ledger subsetting	27
8.6	Ledger permission	27

<b>9</b>	<b>Architectural views of reference architecture</b> .....	<b>27</b>
9.1	General.....	27
9.1.1	Five architectural views.....	27
9.1.2	Notation of diagrams.....	28
9.2	User view.....	29
9.2.1	General.....	29
9.2.2	DLT users.....	30
9.2.3	DLT administrators.....	30
9.2.4	DLT providers.....	31
9.2.5	DLT developers.....	32
9.2.6	DLT governors.....	33
9.2.7	DLT auditors.....	33
9.3	Functional view.....	34
9.3.1	Functional categorization framework.....	34
9.3.2	Non-DLT systems.....	35
9.3.3	User layer.....	35
9.3.4	API layer.....	35
9.3.5	DLT platform layer.....	36
9.3.6	Infrastructure layer.....	38
9.3.7	Cross-layer functions.....	39
9.4	System view.....	45
9.4.1	General.....	45
9.4.2	DLT Nodes.....	46
9.4.3	Application systems.....	46
9.4.4	Non-DLT systems.....	46
9.4.5	Other DLT systems.....	46
9.4.6	Cross-layer functions.....	46
	<b>Annex A (informative) Consideration of tokens, virtual and cryptocurrencies, coins, and associated concepts</b> .....	<b>47</b>
	<b>Annex B (informative) Ledger implementation examples</b> .....	<b>50</b>
	<b>Bibliography</b> .....	<b>51</b>