

Functionalities of blockchain types

Functionalities	Public blockchain	Federated blockchain	Private blockchain
Identity	Anonymous users	Identified users	Identified users
Read	Public	Public or restricted	Public or restricted
Write	Anyone	Authorized participants	Network operator only
Immutability	Almost impossible to tamper	Collusion attacks possible	Collusion attacks possible
Consensus mechanism	Costly proof-of-work, proof-of-stake: all miners - permissionless	Light proof-of-work, federated consensus: selected set of nodes - permissioned	Practical byzantine fault tolerance (PBFT) federated consensus: centralized organi- zation - permissioned
Protocol efficiency	Low level	Higher level	High level
Energy consumption	High level	Lower level	Low level
Transaction speed	Order of minutes	Order of milliseconds	Order of milliseconds
Hosting	Public servers	Private servers	Private servers
Scalability	Low level	Medium level	High level
Examples	Bitcoin, Ethereum	EWf, B3i	Hyperledger, Ripple