

Blockchain Platform Comparison and Technical Report

Comparison Table b/w various Blockchain Platform Comparison

The following table compares three blockchain platforms across public, private, and consortium categories based on their technical characteristics and typical applications.

Blockchain Name	Type	Consensus Mechanism Used	Permission Model	Speed / Throughput (TPS)	Smart Contract Support	Token Support	Typical Use Case	Notable Technical Feature
Ethereum	Public	Proof of Stake (PoS)	Open	~15–30 TPS (Layer 1), 1000+ TPS with L2	Yes (Solidity, Vyper)	Native (ETH)	Decentralized apps (DeFi, NFTs, DAOs)	Strong smart contract & developer tools
Hyperledger Fabric	Private	Plugable (default: Raft / Kafka)	Permitted	~1000–3000 TPS	Yes (Chaincode in Go, Java, Node.js)	No native token	Enterprise supply chains, record management	Modular architecture & private channels
R3 Corda	Consortium	Notary-based (pluggable)	Permitted	~170 TPS (real-world use)	Yes (Kotlin, Java)	No native token	Inter-bank settlements, trade finance	Peer-to-peer architecture with privacy

Short Report on Blockchain

The three blockchain platforms selected—Ethereum (Public), Hyperledger Fabric (Private), and R3 Corda (Consortium)—represent diverse technical architectures catering to different industry needs.

Ethereum is a leading public blockchain that supports decentralized applications (dApps) through its robust smart contract ecosystem. It uses the Proof of Stake (PoS) consensus mechanism and has a permissionless model that allows anyone to participate. Though the base throughput is limited (15–30 TPS), Ethereum has seen massive scalability improvements through Layer 2 solutions like rollups, bringing throughput into the thousands. It also supports a wide range of token standards, making it ideal for applications such as decentralized finance (DeFi), NFTs, and DAOs. Its large developer community and extensive tooling add to its strength.

Hyperledger Fabric, on the other hand, is a permissioned blockchain designed for enterprise use. It supports pluggable consensus mechanisms and offers modularity, allowing for highly customized deployments. With throughput ranging between 1000 to 3000 TPS, it is well-suited for internal business operations and supply chain management among trusted parties. Its support for chaincode in multiple programming languages and private channels for data privacy makes it a go-to solution for regulated environments.

R3 Corda is tailored specifically for financial institutions and regulated markets. Although not a traditional blockchain, its distributed ledger technology enables peer-to-peer transactions with built-in privacy and high security. It does not use a global broadcast method like Ethereum or Fabric but instead communicates only with relevant parties, increasing privacy and scalability. It supports smart contracts written in Kotlin or Java and integrates well with existing banking systems.

Use Case Recommendations:

- **Ethereum (Public Blockchain)**

- **Decentralized Finance (DeFi):** Ethereum is the backbone of the DeFi ecosystem, enabling financial services like lending, borrowing, yield farming, and decentralized exchanges without intermediaries.
- **Non-Fungible Tokens (NFTs):** Ethereum supports NFT standards (like ERC-721, ERC-1155), allowing creators to tokenize digital art, music, collectibles, and virtual real estate.
- **Decentralized Autonomous Organizations (DAOs):** Ethereum powers community-driven organizations that are governed by code and consensus instead of traditional hierarchical leadership.
- **Crowdfunding and Token Sales (ICOs):** Smart contracts allow transparent fundraising campaigns, where contributors receive tokens in return for investments.

● Hyperledger Fabric (Private Blockchain)

- **Supply Chain Management:** Hyperledger is ideal for tracking assets across complex supply chains. Each stakeholder (supplier, manufacturer, distributor) has a permissioned role, ensuring privacy and traceability.
- **Healthcare Data Sharing:** Hospitals and clinics can securely exchange patient data with access controls, ensuring compliance with privacy laws (e.g., HIPAA).
- **Trade & Logistics:** Manages shipping documents, certifications, and customs declarations, reducing paperwork and fraud.
- **Asset and Document Management:** Ensures that internal documents (e.g., contracts, certifications) are immutable, timestamped, and only accessible to authorized parties.

● R3 Corda (Consortium Blockchain)

- **Inter-Bank Settlements:** Banks use Corda for real-time gross settlement systems, allowing direct clearing and settlement with minimal delay and reconciliation.

- **Trade Finance:** Corda supports transactions such as letters of credit, invoice financing, and guarantees among parties with full privacy.
- **Digital Identity and Compliance:** Financial institutions can use Corda to securely share KYC and AML data while maintaining privacy and regulatory compliance.
- **Syndicated Loans:** Coordinates complex multi-lender loan agreements, offering shared ledgers with fine-grained access control for legal and financial records.

In summary, the ideal blockchain platform depends heavily on the nature of the application, the trust level among participants, and the desired level of decentralization and privacy.