Blockchain Platform Comparison and Report

Blockchain Platform Comparison

Attribute	Ethereum	Hyperledger Fabric	R3 Corda
Type	Public	Private	Consortium
Consensus Mechanism	Proof of Stake (PoS - Ethereum 2.0)	Pluggable (Raft, Kafka)	Notary services (validating/non-validating)
Permission Model	Open	Permissioned	Permissioned
Speed / Throughput	~15–45 TPS	~1000+ TPS (depends on setup)	~170–600 TPS (deployment-specific)
Smart Contract Support	Yes (Solidity, Vyper)	Yes (Go, Java, JavaScript)	Yes (Kotlin, Java - JVM based)
Token Support	Yes (Native ETH)	No (no native token support)	No native token (token SDK available)
Typical Use Case	DeFi, NFTs, DAOs, dApps	Enterprise apps (supply chain, healthcare)	Financial services, interbank settlement
Notable Feature	Turing-complete contracts, EVM	Modular architecture, private channels	Point-to-point messaging, state ledger

Blockchain Platform Comparison Report

Ethereum, Hyperledger Fabric, and R3 Corda represent distinct categories of blockchain platforms—public, private, and consortium respectively—each optimized for specific use cases.

Ethereum, as a public blockchain, supports open participation and Turing-complete smart contracts written in Solidity or Vyper. Its Proof of Stake consensus ensures decentralization, but it has relatively lower throughput (~15–45 TPS), making it suitable for decentralized applications (dApps), NFTs, and DeFi platforms where openness and immutability are critical.

Hyperledger Fabric is a private, permissioned blockchain offering high throughput (~1000+ TPS), modular consensus, and support for private data sharing through channels. Its support for smart contracts (in Go, Java, JS) and fine-grained access control makes it ideal for enterprise use cases like supply chain management among trusted parties.

R3 Corda, designed for financial institutions, uses a unique notary-based consensus for point-to-point communication, rather than broadcasting. It supports JVM-based contracts (Kotlin, Java) and provides strong privacy and scalability, making it a top choice for inter-bank applications and regulatory compliance.

Platform Selection & Justification

- Decentralized App: Ethereum – chosen for its decentralized, public nature and robust smart contract support.
- Supply Chain Network: Hyperledger Fabric – selected due to high throughput, permissioned access, and private data channels.
- Inter-bank Financial Application: R3 Corda – preferred for its privacy-focused design, legal contract modeling, and efficient consensus suited for finance.