Blockchain Platform Comparison and Report

# Blockchain Platform Comparison

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| 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.