**1. Ethereum – Public Blockchain Platform**

* Categorized as a **public and decentralized ledger system**, open for participation without restrictions.
* Operates using the **Proof of Stake (PoS)** consensus algorithm, introduced with Ethereum 2.0, which enhances energy efficiency and network security.
* **Accessible to all users globally**, with no permission required to join or interact with the network.
* The **base network (Layer 1)** supports approximately **30 transactions per second**, though performance can be drastically improved using **Layer 2 solutions** such as Arbitrum and Optimism.
* **Smart contracts are natively supported**, primarily developed using the **Solidity language**, with support for **Vyper** as an alternative.
* Fully equipped for **token issuance and management**, supporting ETH as the native currency and a wide array of token standards (e.g., **ERC-20**, **ERC-721**).
* Ideal for **open financial ecosystems**, decentralized applications, and projects requiring public transparency, such as **NFTs and DeFi platforms**.
* Distinguished by a **vast developer community**, strong tooling infrastructure, and seamless integration with various **scaling technologies**.

**2. Hyperledger Fabric – Private Blockchain Infrastructure**

* Recognized as a **permissioned and enterprise-focused blockchain framework**, developed primarily for organizational use.
* Employs a **pluggable consensus architecture**, allowing for mechanisms like **Raft** or **Kafka**, depending on the system’s requirements.
* Network access is **restricted to verified entities**, ensuring that only **trusted participants** can operate nodes or interact with the system.
* Capable of processing **over 2000 transactions per second**, contingent on the configuration and hardware employed.
* Supports smart contract functionalities through its own model called **chaincode**, which can be developed using **Go**, **JavaScript**, or **Java**.
* Does not have a built-in cryptocurrency, as the platform is **not intended for public token exchange or financial speculation**.
* Highly suitable for **corporate ecosystems**, including **supply chain management**, **healthcare information systems**, and other privacy-sensitive applications.
* A key technical strength lies in its **modular architecture** and the ability to form **private communication channels** between designated network participants.

**3. Quorum – Consortium Blockchain Solution**

* Functions as a **permissioned blockchain designed for consortia**, often involving a group of trusted organizations.
* Utilizes either **Istanbul Byzantine Fault Tolerance (IBFT)** or **Raft** for consensus, both optimized for fast execution in controlled environments.
* Participation is **restricted to entities with explicit authorization**, promoting data integrity and operational control.
* Typically delivers **throughput of 200 to 300 transactions per second**, suitable for enterprise applications.
* Maintains compatibility with Ethereum, supporting **smart contracts written in Solidity**, allowing for reuse of existing tools and codebases.
* Offers **optional token creation capabilities**, although it does not include a predefined native cryptocurrency like ETH.
* Best suited for **financial services, interbank settlements, and secure enterprise applications** that require privacy alongside performance.
* Its most notable attribute is the ability to **conduct private transactions within the blockchain**, combining Ethereum's familiarity with enhanced privacy controls.

**Comparative Summary (Point-wise)**

**Ethereum**

* Open-access, public infrastructure with complete decentralization.
* Uses Proof of Stake for energy-efficient consensus.
* Moderate base-level throughput, scalable via Layer 2.
* Strong support for smart contracts and various token standards.
* Entirely transparent by design – no inherent privacy between users.
* Suitable for global, decentralized innovation where trust minimization is key.

**Hyperledger Fabric**

* Strictly permissioned and modular by design.
* Consensus is customizable for performance, not standardized.
* Exceptionally high throughput under optimized conditions.
* Smart contracts are flexible in language (Go, Java, JS).
* Not designed for cryptocurrency-related applications.
* Allows for confidential interactions through private channels.
* Tailored for enterprise-grade applications with strong data governance.

**Quorum**

* Built as a permissioned blockchain suitable for multi-organization use.
* Employs fast and practical consensus suited for trusted settings.
* Moderately high throughput for enterprise-grade tasks.
* Leverages Ethereum’s tooling, supports Solidity-based contracts.
* Token creation is optional; lacks a default native token.
* Enables private transactions within the chain.
* Purpose-built for financial applications demanding both control and confidentiality.

**Platform Suitability by Use Case**

**1. Developing a Public dApp (Decentralized Application)**

**Recommended Choice**: **Ethereum**

* Ensures unrestricted participation and full decentralization.
* Offers a mature ecosystem with strong community and developer support.
* Rich capabilities for deploying smart contracts and managing digital assets.
* Scalability is manageable through modern Layer 2 integrations.

**2. Building a Supply Chain Network Among Trusted Parties**

**Recommended Choice**: **Hyperledger Fabric**

* Provides a secure, permissioned environment for verified stakeholders.
* Achieves excellent transaction throughput, ensuring operational efficiency.
* Allows creation of private, secure channels for selective data sharing.
* Well-aligned with enterprise IT environments, especially where cryptocurrencies are unnecessary.