

Decentralization should be applied where it makes sense. Just because it's a blockchain application doesn't mean it needs to be 100% decentralized. The goal of any blockchain solution is to deliver what the users of that solution need, and this may or may not include certain levels of decentralization. To better understand decentralized networks, the table below breaks out how decentralized networks compare to the more common centralized and distributed networks.

	Centralized	Distributed	Decentralized
<i>Network/hardware resources</i>	Maintained & controlled by single entity in a centralized location	Spread across multiple data centers & geographies; owned by network provider	Resources are owned & shared by network members; difficult to maintain since no one owns it
<i>Solution components</i>	Maintained & controlled by central entity	Maintained & controlled by solution provider	Each member has exact same copy of distributed ledger
<i>Data</i>	Maintained & controlled by central entity	Typically owned & managed by customer	Only added through group consensus
<i>Control</i>	Controlled by central entity	Typically, a shared responsibility between network provider, solution provider & customer	No one owns the data & everyone owns the data
<i>Single Point of Failure</i>	Yes	No	No
<i>Fault tolerance</i>	Low	High	Extremely high
<i>Security</i>	Maintained &	Typically, a shared	Increases as # of

	controlled by central entity	responsibility between network provider, solution provider & customer	network members increase
<i>Performance</i>	Maintained & controlled by central entity	Increases as network/hardware resources scale up and out	Decreases as # of network members increase
<i>Example</i>	ERP system	Cloud computing	Blockchain

Each network architecture has its benefits and tradeoffs. For example, decentralized blockchain systems, unlike distributed systems, typically prioritize security over performance. So, when a blockchain network scales up or out, the network becomes more secure, but performance slows down because each member node must validate all data being added to the ledger. Adding members to a decentralized network can make it safer, but not necessarily faster.

Who is building blockchain applications leveraging decentralization

Every blockchain protocol, decentralized Application (dApp), Decentralized Autonomous Organization (DAO), or other blockchain-related solution adopts varying levels of decentralization. The adoption level is typically based on the maturity of the solution, the time-proven reliability of its incentive models and consensus mechanisms, and the ability of the founding team to strike the right balance. For example, many DAOs have various components at different stages of decentralization: oracles (i.e., third-party services that provide smart contracts with external information) may be partly decentralized, smart contracts might be fully centralized, while the governance process for adjusting parameters is community-driven and decentralized.