Quartz™ - Decentralized Solutions for Enterprises and Ecosystems
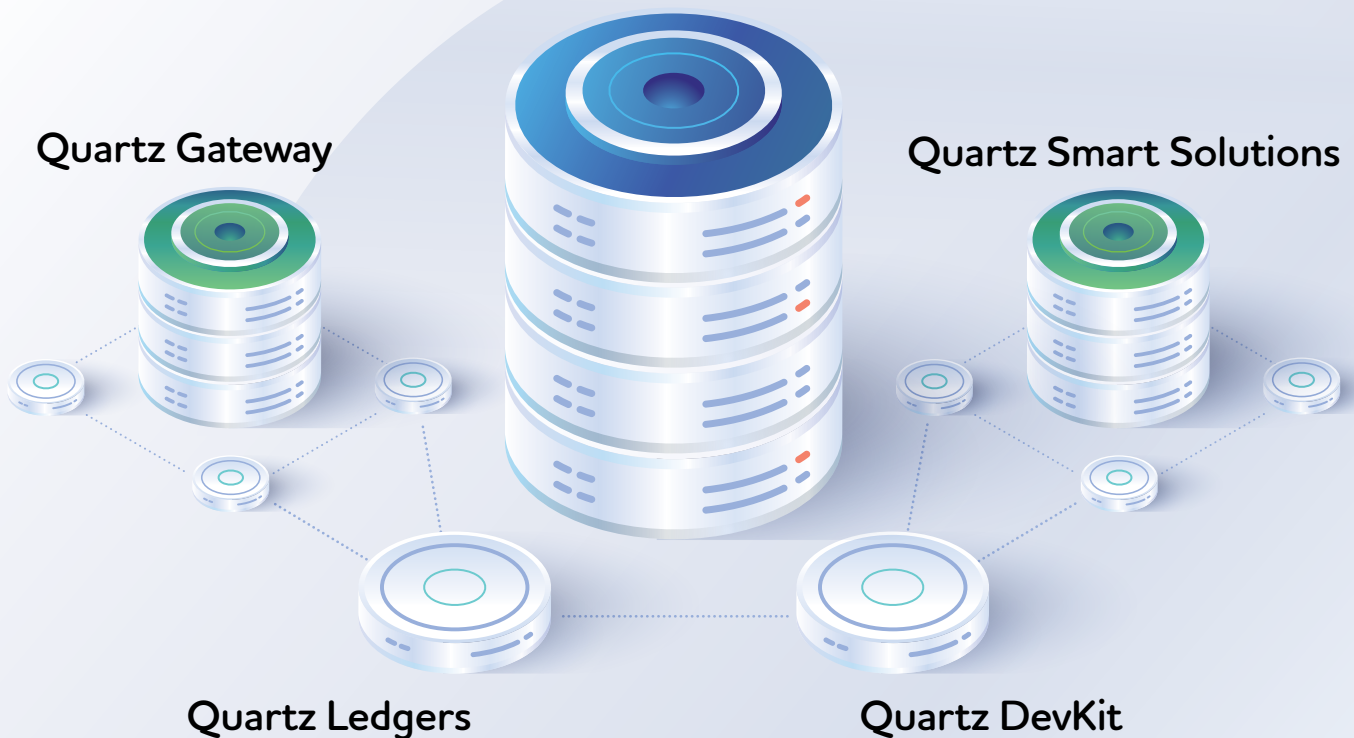
Co-existence. Integration. Interoperability.

Quartz Gateway

Quartz Smart Solutions

Quartz Ledgers

Quartz DevKit

Overview

Blockchain or DLT has the potential to be one of the foundational technologies for tomorrow's businesses and in helping organizations across various industry domains in leveraging decentralized architectures for their businesses. Organizations are already moving towards implementing blockchain technology at scale, in order to drive digitization and automation of business processes. Blockchain is being harnessed today to improve trust and transparency, foster collaboration, eliminate redundancies and reduce risk and time. It is being explored in areas as varied as digital identities and registries, payments, settlements, information exchange, trade, e-Governance, healthcare, Insurance, supply chain, provenance of commodities, music, art and collectibles. The technology also has the power to bring organizations together by enabling ecosystems that amplify the value delivered by each on a stand-alone basis.

Co-existence. Integration. Interoperability.

Businesses are actively collaborating in the creation of connected ecosystems which can offer real-time, efficient transaction processing, without the need for intervention from intermediaries. DLT with its ability to synchronize data across participating entities, builds trust and encourages firms to collaborate in setting up such ecosystems. Firms are best served adopting a philosophy of 'co-existence', of combining the best of their existing solutions with distributed technology, even while moving appropriate parts of the business to decentralised solutions. This approach can help organizations manage risk, save costs and roll out new services that can benefit from the decentralization which the technology offers.

The introduction of blockchain into an ecosystem implies that it needs to 'integrate' all connecting systems or nodes. Such an integration is needed, to not only enable a handshake of existing systems with the blockchain, but to also allow the ecosystem to leverage standard messaging networks as applicable as a way to manage the change and leverage existing data standards.

Blockchain is an evolving technology with different platforms competing to offer varied features, that address real-life issues around the need to manage confidentiality, consensus and security. 'Interoperability' with multiple blockchain technologies, platforms and ecosystems, and even non-blockchain networks will be a critical element to ensure that organizations realize its true benefits. Data exchange between various blockchain networks will be the first step towards interoperability, which will further expand to transaction flows.

Quartz - The Smart Ledgers

Quartz solutions are targeted at helping organizations across industries to leverage blockchain meaningfully for their businesses. They comprise the following:

- **Quartz DevKit** – A Smart contract development kit that enables the development of high quality code for different mainstream Blockchain technologies

- **Quartz Gateway & Command Center** - To enable the seamless integration of existing applications with blockchain ecosystem(s)/network(s) and to facilitate their administration and governance

- **Quartz Smart Solutions** - 'Designed for Blockchain' business solutions

- **Quartz Ledgers** - Off-the-shelf ledger structures, functions and APIs for business processes across various domains, to enable solutions to be quickly built around them

Quartz Smart Solutions

Quartz Smart Solutions are comprehensive solutions with business and domain aware 'Smart Contracts' that help automate processing on the blockchain platform. A Smart contract is a 'self-executable' software that is stored on the ledger and triggered either because of specific events occurring within it or from pre-configured rules that are programmed into these contracts. Participants can provide, consume and instruct these transactions on the ledger based on their role and privileges. Smart Solutions are designed as a combination of on-chain services deployed on Blockchain and off-chain services, residing on traditional databases or files, thus ensuring that only business processes well suited for blockchain are deployed on chain.
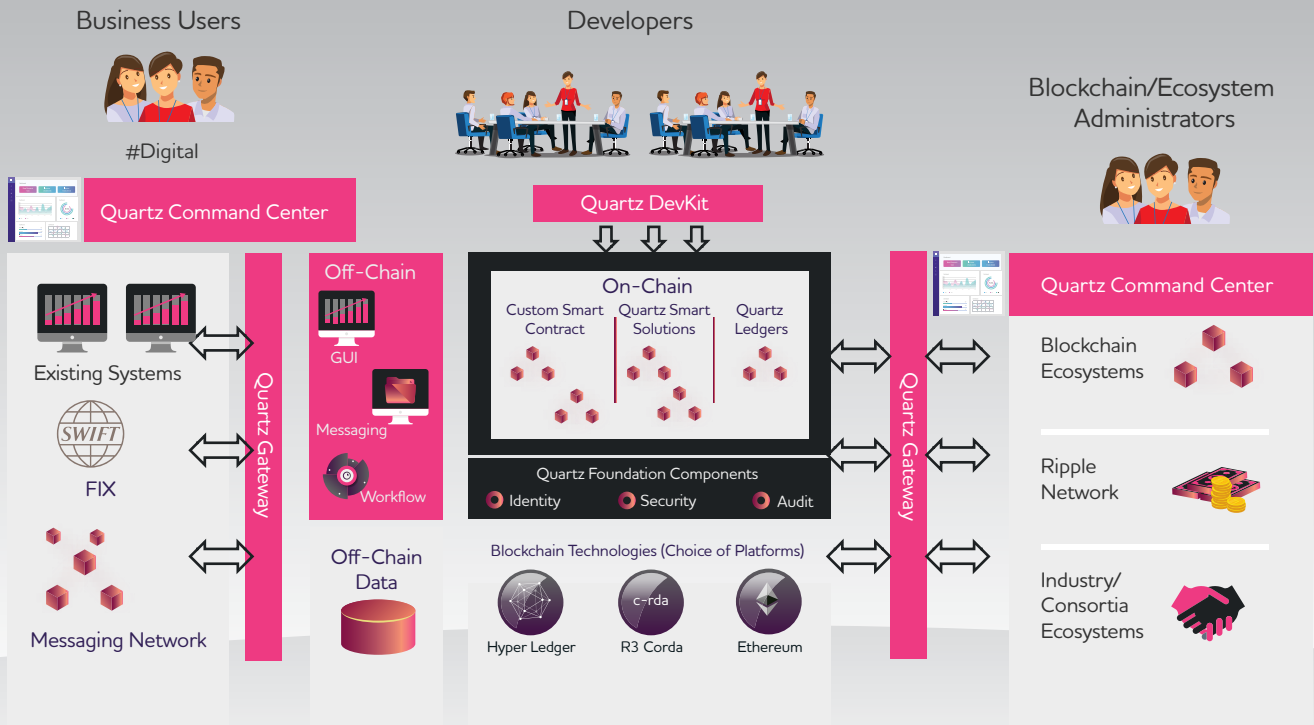
Some of the readily available Smart Solutions include Rewards Points, Contract Authoring, Settlements, Announcements, Crypto Services, Loan Securitization, Facultative Reinsurance, Cross Border Remittances, Markets (for Tokenized assets), Contract Performance Monitoring, Resource Management and KYC.

Quartz Ledgers

Quartz Ledgers comprise predefined, off-the-shelf ledger structures, data models, functions and APIs for business processes across industries. These are conceived as "building blocks" on top of which solutions can be developed and deployed seamlessly, thus enabling customers implement decentralized solutions faster, in an agile manner, and at scale.

Quartz DevKit

Quartz DevKit – an Intuitive, Low code smart contract development kit - is designed to help software developers introduce blockchain into their business processes, and generate, compile, package, and deploy business code on the blockchain. The Quartz DevKit also comprises a standard set of architectural features covering security, data privacy, access controls, user management, audit trails and logging framework. These are together represented as Quartz Foundation Components. Using DevKit's pre-built components for platform setup, administration and deployment, platform security authentication, encryption, and node as well as identity and user management, programmers can write smart contracts 40% faster. This enables organizations in targeting faster launch timeframes on blockchain. This can be further accelerated by combining Quartz Smart Ledgers.

The Art of the Possible - with Quartz

Business Users

#Digital

Quartz Command Center

Existing Systems

SWIFT
FIX

Messaging Network

Quartz Gateway

Off-Chain
GUI
Messaging
Workflow

Off-Chain Data

Developers

Quartz DevKit

On-Chain
Custom Smart Contract | Quartz Smart Solutions | Quartz Ledgers

Quartz Foundation Components
Identity | Security | Audit

Blockchain Technologies (Choice of Platforms)
Hyper Ledger | c-rda R3 Corda | Ethereum

Quartz Gateway

Blockchain/Ecosystem Administrators

Quartz Command Center

Blockchain Ecosystems

Ripple Network

Industry/ Consortia Ecosystems

Quartz Gateway & Command Center

Quartz Gateway is a single, smart channel that can help integrate applications with various blockchain platforms, industry networks and ecosystems using simple REST APIs. Using the Quartz Gateway, organizations can connect seamlessly to multiple blockchain platforms, thereby eliminating the need for large scale and continuous changes to be made to their existing systems. It facilitates interoperability between blockchains and with other messaging networks, and industry standards like ISO. It also supports orchestration of services across multiple blockchain platforms thus delivering agility and flexibility to organizations operating diverse business processes.

The Command Center helps a blockchain sponsor, to administer and maintain oversight of the entire blockchain network. It provides a comprehensive visual representation of all the activities taking place within the blockchain ecosystem at any point in time, and allows the system administrator of the sponsor to make key decisions when administering the network.

The Quartz Advantage

- **Co-existence and Interoperability:** Quartz solutions are built on this philosophy and can integrate with third-party solutions and various blockchain based systems and networks.

- **Integration:** Quartz solutions are simple, lightweight and can seamlessly bring together third-party solutions, legacy applications and messaging middleware. They can therefore reduce entry barriers to blockchain adoption by insulating connecting systems from the complexities of the underlying blockchain.

- **Agile Development and Deployment Framework:** Quartz DevKit along with the Quartz Foundation can provide an agile framework for faster development and deployment of business applications on a choice of Blockchain platforms.

Leveraging these architectural principles and using Quartz, your organization can:

- Create decentralized architectures that can power business ecosystems

- Automate business processes and functions with Smart Contracts

- Eliminate data duplication and associated reconciliation issues

- Ensure data integrity with cryptographic encryption of data, making it immutable

- Restrict access (private permissioned ledger) to ensure greater security.

Backed by awards from the **Financial Technology Forum** (Best Blockchain Breakthrough of the Year 2019) and recognition from Analysts (**Leader & STAR Performer in Everest PEAK Matrix**), Quartz can help you operate at the forefront of technology innovation and spearhead blockchain adoption successfully within your enterprise and beyond.

To know more about Quartz Blockchain Solutions, please write to us at **tcs.quartz@tcs.com**, or visit our website
https://www.tcs.com/what-we-do/products-platforms/quartz

Awards & Recognition

TCS is a globally recognized industry leader, with its solutions consistently recognized in top positions by industry experts.

TCS' Quartz™ Solution Wins Award for Outstanding Innovation - Asset Servicing Industry Excellence Awards 2022	TCS' Blockchain Solution, Quartz™ Ranked #1 Best Performing Fraud Management Solution	Quartz™ for Markets Named Best New Post Trade Solution of the Year by Financial Technologies Forum

Quartz is a startup incubated in TCS to create innovative solutions that leverage the emergence of blockchain technology

Quartz provides foundational technology, tools and business components for creating distributed solutions for varied industries

To know more about Quartz, please write to us at tcs.quartz@tcs.com, or visit our website https://www.tcs.com/what-we-do/products-platforms/quartz

About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is a purpose-led transformation partner to many of the world's largest businesses. For more than 50 years, it has been collaborating with clients and communities to build a greater future through innovation and collective knowledge. TCS offers an integrated portfolio of cognitive powered business, technology, and engineering services and solutions. The company's 469,000 consultants in 46 countries help empower individuals, enterprises, and societies to build on belief.

Visit www.tcs.com and follow TCS news @TCS_News.