HYPERLEDGER
BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Case Study:

When Hyperledger Sawtooth Met Kubernetes - Simplifying Enterprise Blockchain Adoption

Company
Founded in 2018, Blockchain Technology Partners (BTP) is a leading enterprise blockchain company and an active member of both the Hyperledger and CNCF communities.

Challenge
BTP aims to ensure that businesses can not only roll out blockchain networks but also operate and maintain them over a long time either directly, for example as members of a consortium, or through an agreed third party.

Approach
By combining Hyperledger Sawtooth as their open source blockchain framework of choice with Kubernetes as the operational layer, BTP created Sextant. Sextant is a blockchain management platform that radically simplifies the development, deployment and ongoing management of blockchain-based enterprise applications.

Result
Sextant launched in late 2018 and is currently available on the AWS marketplace, with support for Google Cloud, Azure, and Alibaba coming soon. From July 2019, the platform will also offer support for the DAML smart contract language.

Taking blockchain projects to production and beyond

Companies are increasingly interested in blockchain technology as a means to digitize and improve business processes. According to Forbes, citing International Data Corp, total corporate and government spending on blockchain is expected to hit $2.9 billion in 2019, an increase of 89% over the previous year, and reach $12.4 billion by 2022[1].

Many enterprise blockchain projects are currently in the proof-of-concept or pilot stage. But as these implementations are rolled out in production, companies will need access to expertise in maintaining and operating large-scale, often cloud-based, systems.

"A blockchain network is like the power grid: it is there for the long term and must never go down," explains Duncan Johnston-Watt, CEO of Blockchain Technology Partners (BTP). "You cannot just deploy it and walk away. The network needs to be maintained and updated. That's where we can help".

Companies that launch blockchain initiatives are making a commitment that a distributed ledger will be available indefinitely. In order to realize this commitment, they need to combine operational know-how with blockchain expertise. Duncan Johnston-Watt and Kevin O'Donnell saw an opportunity to apply their experience in open source, operations and cloud to the implementation of blockchain networks. Thus, Blockchain Technology Partners (BTP) was born. The company aims to make it much easier for enterprises to adopt blockchain technologies. Their mission is to ensure that businesses can not only roll out blockchain networks but also operate and maintain them over the long haul.

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>
> — Dan O'Prey, *CMO and Head of Community at Digital Asset and Chair of the Hyperledger Marketing Committee.*

Hyperledger Sawtooth + Kubernetes = a match made in open source heaven

The founding team of BTP has a longstanding relationship with the Linux Foundation, having been a member through previous companies. The team felt that Hyperledger's open source, industry-agnostic approach was aligned with their view of the world.

"After carefully evaluating the alternatives, we selected Hyperledger Sawtooth as our preferred open source blockchain technology on the basis of its highly modular architecture – it has been designed so that you can start small and then add additional services," explains Johnston-Watt. "Also the clear separation between the network and the application tiers makes it exceptionally easy for developers to create new transaction processors leveraging existing code and programming best practices. Finally, its support for smart contract languages is second to none."

HYPERLEDGER
SAWTOOTH

Hyperledger Sawtooth is a blockchain framework and one of the Hyperledger projects hosted by the Linux Foundation. With potential in many fields, from IoT to financials, Hyperledger Sawtooth has an architecture that recognizes the diversity of requirements across the spectrum with support for both permissioned and permissionless deployments. It includes a novel consensus algorithm, Proof of Elapsed Time (PoET), which targets large distributed validator populations with minimal resource consumption. Designed for versatility and scalability, Hyperledger Sawtooth was initially contributed by Intel.

"...In our view, Hyperledger Sawtooth and Kubernetes are made for each other."

– Duncan Johnston-Watt, *CEO of Blockchain Technology Partners (BTP)*

The next step for BTP was selecting an operational layer for their chosen blockchain platform. The team initially looked at Apache Brooklyn – an open source project Johnston-Watt had helped create in a previous life – but quickly concluded that Kubernetes was the right choice for Sawtooth. They noticed that a lot of the applications in the Hyperledger community were container-based. "Kubernetes is now the de-facto standard for container-based orchestration," says Johnston-Watt. "And in our view, Hyperledger Sawtooth and Kubernetes are made for each other." Both are open source technologies with a large and growing ecosystem.
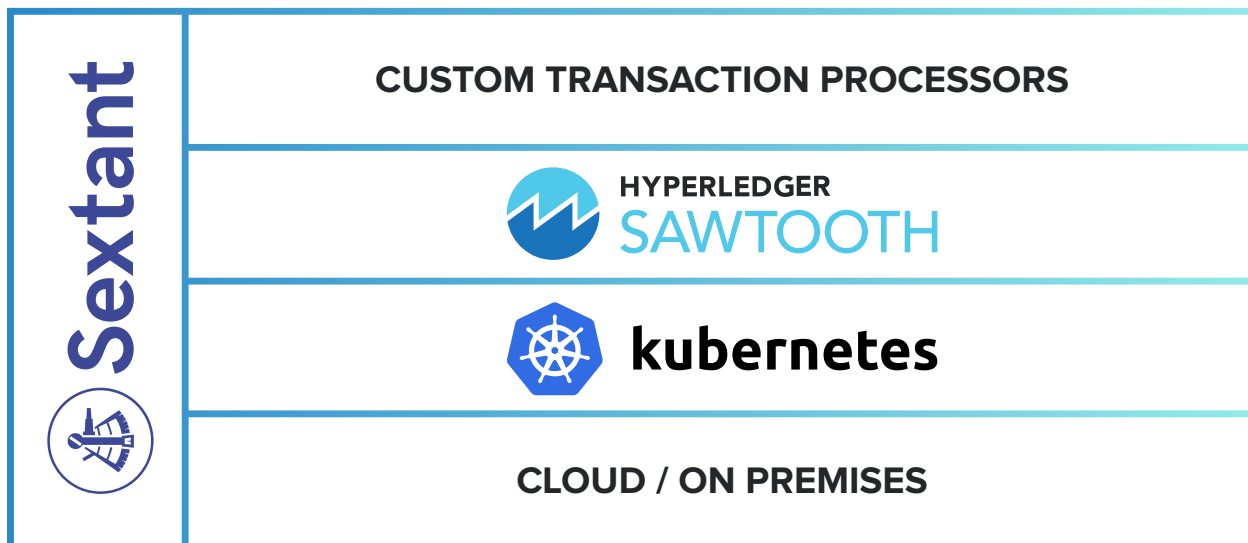
kubernetes

Kubernetes (K8s) is an open source system for automating deployment, scaling, and management of containerized applications. It groups containers that make up an application into logical units for easy management and discovery. Kubernetes builds upon 15 years of experience of running production workloads at Google, combined with best-of-breed ideas and practices from the community. Kubernetes is a project of the Cloud Native Computing Foundation.

Sextant

By combining Hyperledger Sawtooth as their open source blockchain framework of choice with Kubernetes as the operational layer, BTP created Sextant. **Sextant** is a blockchain management platform that radically simplifies the development, deployment and ongoing management of blockchain-based applications. Sextant utilizes a BTP certified distribution of Hyperledger Sawtooth to deliver one-click deployment of enterprise-grade Sawtooth networks on Kubernetes running on premises, in the cloud or both.

Sextant launched in November 2018 and is currently available on the AWS marketplace, with support for Google Cloud, Azure, and Alibaba coming soon.

Sextant

CUSTOM TRANSACTION PROCESSORS

HYPERLEDGER SAWTOOTH

kubernetes

CLOUD / ON PREMISES

Blockchain
Technology
Partners

Bringing smart contracts to Hyperledger Sawtooth via Sextant

Most enterprise blockchain networks aim to simplify business transactions among various parties. These transactions are often implemented on the blockchain as smart contracts, self-executing contracts with the terms of the agreement between the relevant parties directly written into lines of code. One popular language for writing smart contracts is DAML. It was created by Digital Asset, a founding member of Hyperledger.

DAML is an open source functional programming language designed specifically for use in multi-party business processes. DAML abstracts away the underlying complexities of blockchains and database technologies, allowing developers to focus on the logic of the applications they are building.

DAML went open source in April 2019 to enable integration with other platforms. Hyperledger projects were among the first on their radar. "As we were preparing to go open source, we looked for partners to engage with for the transition," explains Chris Clason, Director of Strategic Alliances at Digital Asset. "BTP stood out to us because they understand the importance of managing not only the underlying blockchain infrastructure but also the DAML smart contract layer." Clason adds that they were impressed with BTP's expertise in the open source community and their knowledge of the full stack of both Hyperledger Sawtooth and DAML. Finally, Sextant, BTP's blockchain management platform, was an excellent vehicle, because it made it even easier for developers to get an application up and running quickly.

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In April 2019 Digital Asset announced[2] that DAML will now integrate with Hyperledger Sawtooth through Sextant. BTP will offer an enhanced version of Sextant with DAML support on AWS in July 2019, with support for other cloud providers soon after this.

"With a mapping between this abstraction layer and the specifics of a given platform, as BTP is developing for Hyperledger Sawtooth, DAML applications can be ported from platform to platform without complex rewrites," said Dan O'Prey, CMO & Head of Community at Digital Asset and Chair of the Hyperledger Marketing Committee[3].

In the spirit of open source, Digital Asset and BTP plan to submit the DAML integration to the upstream Hyperledger Sawtooth community. This was covered in Dan's Hyperledger blog post DAML smart contracts coming to Hyperledger Sawtooth[4].

Brian Behlendorf, Executive Director of Hyperledger, said, "Following the recent announcement that DAML has been open sourced, we are delighted that work is already underway to integrate the DAML runtime with Hyperledger Sawtooth. This demonstrates the power of the open source community to enable collaboration and give developers the freedom required to truly move the industry forward."[5]

"By integrating DAML with Hyperledger Sawtooth, developers will be able to combine the best of open source smart contract languages with one of the key emerging open source blockchain platforms," said Dan O'Prey, CMO and Head of Community at Digital Asset and Chair of the Hyperledger Marketing Committee.[6]
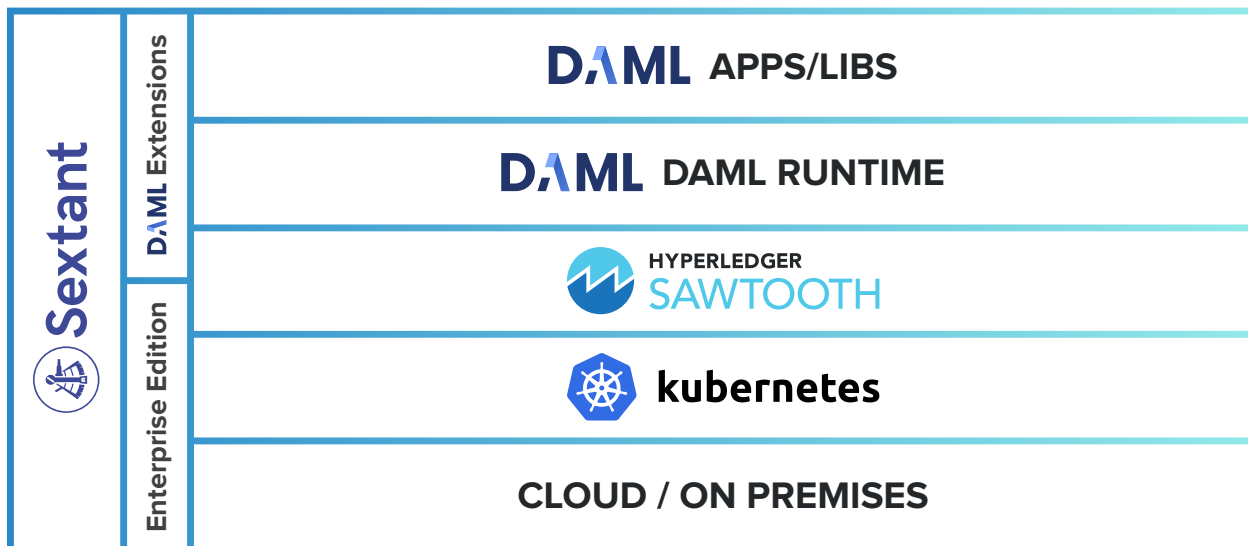
About Blockchain Technology Partners

Founded in 2018, Blockchain Technology Partners (BTP) is a leading enterprise blockchain company. BTP brings the benefits of blockchain to business by providing Sextant™ – a blockchain management platform that radically simplifies the development, deployment and ongoing management of blockchain-based applications. Sextant utilizes a BTP certified distribution of Hyperledger Sawtooth to deliver one-click deployment of enterprise-grade Sawtooth networks on Kubernetes running on premises, in the cloud or both. To learn more, visit https://blockchaintp.com.

About Hyperledger

Hyperledger is an open source effort created to advance cross-industry blockchain technologies. It is a global collaboration including leaders in banking, finance, Internet of Things, manufacturing, supply chains, and technology. The Linux Foundation, the nonprofit organization enabling mass innovation through open source, hosts Hyperledger. The Linux Foundation also enables a worldwide developer community to work together and share ideas, infrastructure, and code. To learn more, visit https://www.hyperledger.org/

Sources

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2. https://hub.digitalasset.com/press-release/digital-asset-and-blockchain-technology-partners-to-deliver-daml-smart-contracts-for-hyperledger-sawtooth

3. https://www.hyperledger.org/blog/2019/04/16/daml-smart-contracts-coming-to-hyperledger-sawtooth

4. Same as above

5. Same as above

6. Same as above