

Enabling users to deploy, monitor, analyze and compare the behavior of many different blockchain networks.

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The Facts

- The current blockchain ecosystem is fragmented.
- Different implementations of heterogeneous blockchains.
- The deployment processes of blockchain protocols:
 - Have many dependencies and assume a certain level of technical expertise.
 - Are complex and time-consuming.
 - Are based on primitive command line deployment /testing scripts.

The Challenges

- Comparing and evaluating the performance of different blockchain implementations.
- Understanding their behavior, in the presence of faults or malicious attacks.
- Setting up and configuring private deployments of blockchain protocols is complex, and time consuming.
- Stress testing the protocols under "close-to-real" conditions is complex.

The Need

- An open-source, easy to use, holistic, and extendable framework.
- A framework that will incorporate technical and non-technical teams.
- A framework to deploy, monitor, analyze, compare, and report various blockchain performance activities.

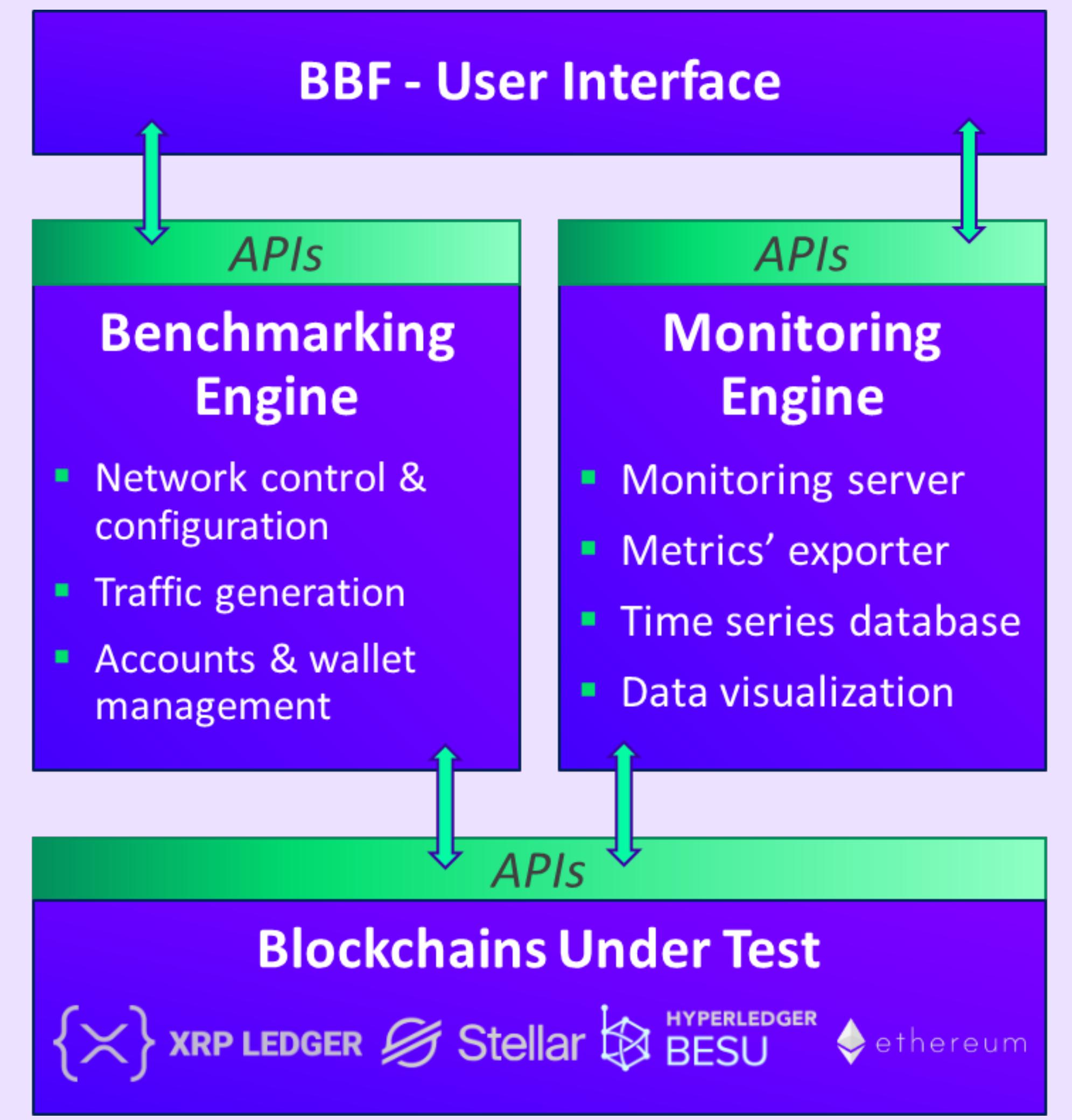
The Solution

- A modular BBF that aims to:
 - Automate the deployment processes of various blockchain protocols.
 - Abstracting the technical details from the end-user.
 - Analyze, and evaluate the behavior of various consensus proposals under different blockchain network deployments.
 - Expose the user to a UI, abstracting the complexities and time-consuming configuration processes from the end user.

Supported Networks



The BBF Architecture



Learn More

- IEEE Access 2022 Journal Article: "A Systematic Literature Review Toward a Blockchain Benchmarking Framework", M. Touloupou et al.
- HICSS 2022 Conference: "Benchmarking Blockchains: The case of XRP Ledger and Beyond", M. Touloupou et al.
- BRAINS 2021 Conference : "Towards a Framework for Understanding the Performance of Blockchains", M. Touloupou et al.
- Medium Article: "The Big Bang of Blockchain Consensus Algorithms: The Case of the XRP Ledger", K. Christodoulou et al.
- Medium Article: "The Big Bang of Blockchain Consensus Algorithms (Part II)", M. Touloupou et al.
- Medium Article: "The Big Bang of Blockchain Consensus Algorithms (Part II)", M. Touloupou et al.

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Supported Consensus

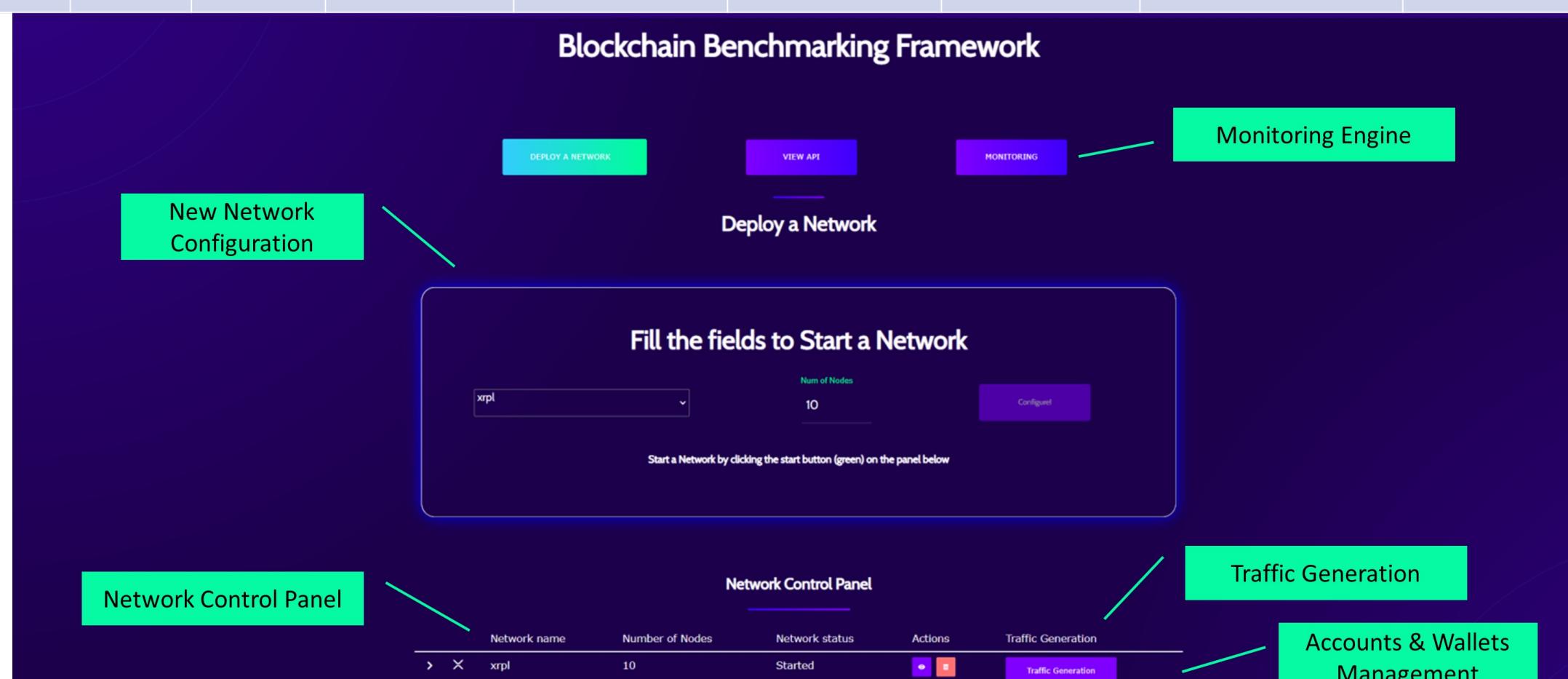
- Proof of Work (PoW)
- Proof of Stake (PoS)
- Stellar Consensus Protocol
- Clique
- XRP Ledger Consensus Protocol

XRPL Case

- **XRPL Experimental Setup:**
 - **Nodes:** 10 proposers & 8 of them acting as validators
 - **Network Topology:** Full mesh network
 - **Traffic Generation:** 1m transactions were submitted to random accounts, exchanging a random amount of XRPs.
 - **Exposed Metrics:** ServerLatency, validationQuorum, loadFactor, Peers, Uptime, serverStateDurationUs, convergeTimeS and proposers.

XRPL Case: Experimental Evaluation

	Run	Nodes	Validator Quorum	Transactions	Successful Transactions	Time (h)	Converge Time (sec)	Server Latency (sec)
Mean Value	1	10	8	1.000.000	975621	~ 2.058	2.7	1
	2	10	8	1.000.000	976020	~ 2.057	2.7	1
	3	10	8	1.000.000	975554	~ 2.059	2.7	1
	4	10	8	1.000.000	975570	~ 2.058	2.7	1
	5	10	8	1.000.000	975769	~ 2.059	2.7	1
					975706.80	~ 2.05	2.7	1



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